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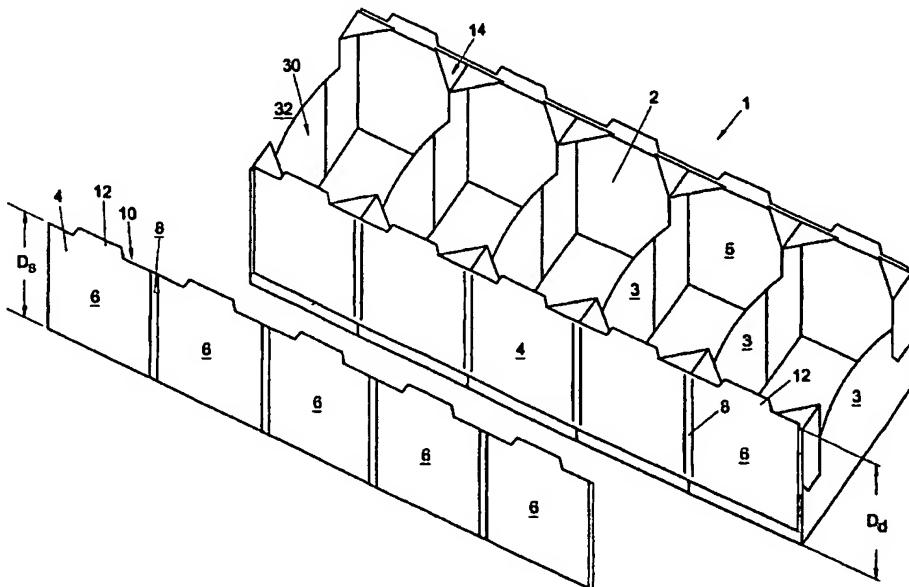
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(54) Title: PACKAGE, COMPRISING A SERIES OF SUBPACKAGES



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(57) Abstract: A package (1) for, in particular, loose, at least detachable, products such as consumer products, which package is substantially manufactured from sheetlike material, comprising a series of subpackages (2) which are arranged in at least one row and are mutually connected on at least one side by connecting means (4), which connecting means comprise, at least determine tear lines or breaking lines (8) along which the connecting means can be broken for separating from each other and individualizing at least two subpackages arranged next to each other.



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

**Title: Package, comprising a series of subpackages.**

The invention relates to a package for loose, at least detachable products, in particular consumer products. Such packages are known from practice.

Loose, at least detachable products, in particular when they are intended for use as consumer products, are typically packaged in, for instance, cardboard boxes, in which the products are transported to a store or the like. In the store, the products in the boxes are offered to the consumer. The consumer or the retailer must measure or weigh and repack a desired amount of product. The original transport package remains behind in the store and is to be discarded by the retailer. Such a package therefore entails the disadvantage for the retailer that measuring and repacking the products take relatively much time and moreover lead to much waste for the retailer. A further disadvantage is that the products when displayed in this transport package have an unattractive appearance. Repacking the products from the transport package to, for instance, a display case, leads to still more work, which is undesired.

It has previously been proposed to pack a number of loose packages, each filled with product, in an outer package, such that they can be readily arranged in a store or the like. In these known packages, the outer package, which is entirely closed around the loose packages during transport, is removed entirely and discarded separately from the packages. The loose packages are displayed in the store in display racks or the like. This has as a disadvantage that the retailer is left with the loose outer packages and must discard them. Moreover, after removing the outer packages, the individual packages are loose from each other, so that they cannot be readily picked up jointly anymore. Further, this means that the retailer must place the individual packages in the display case, which is time consuming and costly.

The invention contemplates a package of the type described in the opening paragraph hereof, in which the above-mentioned disadvantages of the known packages are avoided while maintaining the advantages thereof. To that end, a package according to the invention is characterized by the 5 features according to claim 1.

Surprisingly, it has been found that in such a package an individual subpackage can be separated from the row relatively simply, without all subpackages thereby coming loose from each other. The row of subpackages can be manipulated in its entirety, also when a subpackage has already 10 been separated therefrom. Further, such a package prevents a loose outer package being left when all subpackages have been taken away, since parts of the connecting means connected with the subpackage remain connected with the respective subpackage. As a consequence, at least substantially no parts of the package remain behind with the retailer. Moreover, the retailer 15 does not need to take the subpackages from an outer package and display them in his store in a display case or the like. The mutually connected subpackages can function as display package and as take-away package. By making use of substantially sheetlike materials for the package, subpackages are obtained having a relatively small volume of packaging 20 material, which moreover is relatively light. An additional advantage thus achieved is that transportation and storage of such packages is possible in an advantageous manner. A further advantage thus achieved is that the subpackages have a pleasant appearance, also when subpackages have been separated from the row, while such separation is readily possible by means 25 of the tear lines or breaking lines. For packers, a package according to the present invention has the advantage that packaging, for instance, individual portions of products is possible in a simple manner, while the rows of subpackages, due to the mutual connections, can be manipulated in their entirety.

In this description, subpackage is to be understood to mean at least a box or like packaging unit, to be included in a series of such packaging units. This may include outer boxes or like transport packages.

5 In an advantageous embodiment, a package according to the invention is characterized by the features according to claim 2.

By designing the connecting means such that at least on one side of the row a strip of material is provided which is secured to the respective side of the subpackages and is provided with the tear lines or breaking lines, a row of subpackages is obtained, the subpackages of which can be simply torn 10 loose or broken loose. Indeed, the tearing direction has been chosen such that the upper side of the subpackages can be held facing upwards, while a subpackage can be torn loose by tilting it about a line approximately at right angles to the or each respective tear line. When further the position of the tear lines is chosen such that they are located adjacent to, or preferably 15 in, a plane forming the plane of contact between the respective subpackages, the detachment of a subpackage is simplified still further, while moreover a pleasant appearance of both the respective subpackage and the remaining row is obtained. The connecting parts then remain connected with the respective subpackages, so that they will be taken along 20 by the user and will not remain behind in the store.

In further elaboration, a package according to the present invention is further characterized by the features according to claim 3.

25 In such an embodiment, the advantage is obtained that the position where a subpackage is torn loose is accurately fixed, while tearing loose will occur such that a clean cut is obtained. The chance of inward tearing of the connecting means and/or a side of a respective subpackage other than along the or each tear line or breaking line is thereby reduced considerably, while the agreeable appearance of the subpackages in and outside the row is preserved.

In a further advantageous embodiment, a package according to the present invention is further characterized by the features according to claim 6.

In such an embodiment, the advantage is obtained that the connecting means at the same time interconnect the subpackages and cover them at the open upper side. The covering part of the connecting means will, upon detachment of a subpackage, remain positioned over the opening and therefore protect the products during further transportation. Moreover, this prevents the possibility that during transport and storage of the (sub)packages, products can be removed from them without this being subsequently visible from outside. Loose seals and the like are then not needed anymore, which simplifies use and reduces the risk of contamination.

In an alternative embodiment, a package according to the invention is characterized by the features according to claim 8.

In such an embodiment, by the sheetlike element, covers are offered for the different subpackages, while the subpackages can be simply separated from each other, at least partly, by opening one or more of the covers. The tear lines or breaking lines then determine at least partly the connections between the covers and hence between the subpackages. Thus subpackages that are particularly simple to use are obtained.

In an alternative embodiment, a package according to the invention is characterized by the features according to claim 9.

In such an embodiment, a number of subpackages are mutually connected by the sheetlike element, which on a first side, by pulling away a tear strip, can be detached in the form of a cover, such that on the opposite side it remains pivotally connected with the subpackages, while the subpackages, preferably on the side where the tear strip was located, by the removal thereof, are separated from each other and are opened by pivoting the remaining sheetlike part. The individual subpackages are then

approachable, though still mutually connected by the sheetlike element. It is then preferred that the sheetlike material on the side where it is pivoted comprises a further tear line along which the pivoting part can be torn loose. It is then preferred that this pivoting part is connected through this 5 further tear line with individual adhesive surfaces which are glued to the different subpackages, so that after tearing the pivoting part loose, the adhesive surfaces are mutually separated from each other, so that also the individual subpackages come to stand entirely loose from each other.

It is preferred that the subpackages have a length and width such that 10 rows formed therefrom are fittingly stackable onto a Euro pallet or in a Euro container or a different standardized package, transport unit or shelf supplementing unit or the like. Since the packages according to the present invention do not need to be packed in an outer package anymore, they can be stacked directly onto a pallet or in a container, thus yielding considerable 15 advantages in terms of space and weight during storage and transport. Moreover, the operations required therefor are limited to a minimum. Further, important environmental advantages are achieved herewith.

The invention further relates to a method for packaging products, characterized by the features according to claim 15.

Such a method provides the advantage that products can be packaged 20 and transported in a particularly simple manner, whilst the storage and transport package can be used particularly well for presenting the products in a store or the like. In such a method, the subpackages can be simply detached by a consumer and be taken along, which provides the advantage 25 that repacking the products is not necessary anymore, the subpackages do not need to be transferred, and the user, in particular the retailer, is not left with any waste, at least a minimum of waste. For the user, in particular the consumer, this method provides the advantage that the amount and the quality of the products are guaranteed and the user can simply take away 30 the desired amount.

A method according to the present invention is further preferably characterized by the features according to claim 16.

By the use of connecting means folded from a sheetlike blank, with a central part covering the subpackages arranged and the longitudinal edges 5 secured to the side of the subpackages for forming the connecting means, the subpackages, after being filled, can be rapidly and easily closed and simultaneously be interconnected. Upon subsequent detachment of a subpackage, the covering central part is thereby detached as well, so that a consumer can take away a closed subpackage with contents. In a simple 10 manner, this prevents the possibility of the contents becoming dissociated from a subpackage, while moreover the contents are thereby guaranteed. Indeed, no part of the contents can be removed or replaced without damaging or removing the central part.

In an alternative embodiment, a method according to the present 15 invention is characterized by the features according to claim 17.

In such a package, the central part can be torn loose from the longitudinal edges relatively simply, for releasing the open side of the subpackage. This tearing loose can be done both with the subpackages still 20 mutually connected and with detached subpackages.

The invention further relates to a method for presenting products, in particular consumer products, in a store or the like, characterized by the 25 features according to claim 18.

Such a method provides the advantage that products can be simply and rapidly displayed in a store, while they moreover present a pleasant 30 appearance. The products, packaged in the subpackages, can be rapidly and readily taken along by consumers, without any amounts needing to be weighed or measured. Moreover, the advantage thereby achieved is that substantially no waste is left in the store, no repacking by the retailer is necessary, and hence also no loose consumer packages are necessary, and no products need to be lost.

Further advantageous embodiments are described in the further subclaims.

To clarify the invention, a number of examples of packages and methods according to the present invention will be further described with 5 reference to the drawings. In the drawings:

Fig. 1 shows a first embodiment of a package according to the invention;

Fig. 1A shows a blank for a subpackage according to Fig. 1;

Fig. 1B shows a portion of a breaking or tear line;

10 Fig. 2 shows a second embodiment of a package according to the invention;

Fig. 3 shows a third embodiment of a package according to the invention;

15 Fig. 4 shows a fourth embodiment of a package according to the invention;

Fig. 5 shows a fifth embodiment of a package according to the invention;

Fig. 6 shows a sixth embodiment of a package according to the invention;

20 Fig. 7 shows examples of embodiments of a subpackage according to the invention;

Figs. 8A-C show three formation configurations with packages according to the invention.

25 Figs. 9A-C show a seventh embodiment of a package according to the invention;

Figs. 10A-B show an eighth embodiment of a package according to the invention;

Figs. 11A-C show a ninth embodiment of a package according to the invention;

Figs. 12A-B show a tenth embodiment of a package according to the invention; and

Figs. 13A-C show an eleventh embodiment of a package according to the invention.

5        In this description, the same or corresponding parts have the same or corresponding reference numerals. The packages, that is, the subpackages and connecting means and any loose parts applied in a package or method according to the present invention are preferably all manufactured from such material that after use no separation of waste is necessary, but that  
10      the material can be collectively reused. Used here, in particular, is cardboard or paper, optionally provided with a recyclable plastic layer such as polyethylene, at least on the side of the respective parts that faces the product. However, other materials can also be used.

Fig. 1 shows a first embodiment of a package 1 according to the present  
15      invention, comprising a series of boxlike subpackages 2, five in number in the embodiment shown. The subpackages 2 have been individually folded from cardboard blanks and have been shoved against each other by their long sides 3, thereby forming a continuous row. A strip 4, made of cardboard, has been glued on opposite sides of the row of subpackages 2 to  
20      the short sides 5 thereof, such that the subpackages 2 are fixedly connected with each other in the respective row. Each strip 4 is provided, by way of connecting means, with a number of adhesive surfaces 6, corresponding in number with the number of subpackages. The adhesive surfaces 6 are  
25      mutually separated by breaking/tear lines 8, to be described in more detail hereinafter. Hereinafter in the description, these and comparable lines 8 will be further referred to as tear lines 8. In Fig. 1 a strip 4 is shown in loose condition, in perspective view, while two of such strips 4 have already been provided on the subpackages 2. Each adhesive surface 6 is provided along the upper edge 10 thereof with a projecting supporting flap 12, which, in a  
30      condition when glued to the subpackages 2, extend above the upper surface

14 of the series of subpackages 2, the arrangement being such that when two rows of subpackages 2 are placed onto each other, the supporting flaps 12 of the lower row of subpackages 2 abut against the short walls 5 of the upper row of subpackages 2. To that end, the height  $D_s$  of the strip 4 is 5 slightly smaller than the height  $D_d$  of the subpackages 2. With the strip 4 in fitted condition, a part of the sidewall 5 of each subpackage 2 is left clear under the strip 4.

In the embodiment shown in Fig. 1, each subpackage 2 has been folded from a blank 16 as shown in Fig. 1A. Such a blank and a box folded therefrom are known from practice. In this box, the longitudinal walls 3, 5 are connected with the bottom surface 18 through respective fold lines 3A, 10 5A. Provided on the sidewall 5, through a fold line 20A, is an adhesive flap 20 which, when the box has been set up, is glued to the inside of the longitudinal wall 3. Through a further fold line 22A, a triangular 15 supporting flap 22 is connected with the operatively upper longitudinal edge 24 of the sidewall 5, this triangular supporting flap 22 having a second adhesive flap 26 connected thereto, through a fold line 26A extending in line with the fold line 20A. In use, this second adhesive flap 26 is glued to the outer side of an adjacent longitudinal wall 3. As a consequence, the 20 triangular supporting flap 22, when the box is set up, is disposed in a plane parallel to the bottom 18. In the series of subpackages 2, the triangular supporting flaps 22 of the subpackages 2 constitute the upper surface 14 and bound the filling and take-out openings 30 of the subpackages. In 25 stacks of the series of subpackages 2 as shown in Fig. 1, the triangular flaps 14 of a lower row of subpackages 2 will carry the upper row. In the sidewall 3 a recess 32 is provided, so that each subpackage 2 obtains a pleasant appearance.

In Fig. 1B, in axonometric view, on a slightly enlarged scale, a tear line 8 is shown, in undivided and in divided condition. Such tear lines are 30 described in more detail in the international patent application filed on the

same date, entitled: "Package, comprising a series of subpackages having improved carrying capacity", of the same applicant, which is understood to be incorporated herein by reference. In this embodiment, cardboard has been used having a core 34, provided on opposite sides with a layer 36 of 5 paper. Other covering layers may also have been used, such as, for instance, polyethylene. The tear line 8 comprises two parallel cuts 38, 40, in side view staggeredly positioned with respect to each other. The first cutting line 38 is provided from a first side of the strip 4, the second line from the opposite side. The first 38 and the second cutting line 40 both have a depth such that 10 they do not entirely cut through the cardboard and do not reach at least the layer 36 located on the side opposite the side from which the respective cutting line 38, 40 has been provided. The core 34 is wholly or partly cut through by each of the cutting lines 38, 40. As a consequence, the strip 4 still has sufficient bearing power and is yet relatively easy to tear loose. 15 Upon tearing loose a first surface 6 from an adjacent second surface 6 along the tear line 8, only the core 34 between the two cutting lines 38, 40 will have to be broken, at least torn loose, which is possible in a relatively simple manner, in particular when the core 34 is manufactured from cardboard of a layered structure or comparable fiberboard. Such a tear line 20 8 provides the advantage that tearing yields relatively smooth edges, namely as a result of the respective cutting lines 38, 40, so that a pleasant appearance is preserved and tearing at a suitable position is ensured. For that matter, in a comparable manner, a tear line can be provided in, for instance, solid cardboard, corrugated cardboard, or the like, or sandwich 25 cardboard built up in any other way. It is also possible, however, to form a tear line 8 in a different manner, for instance by the provision of a weakened line from one side of the strip 4, by perforation of the strip 4 or other suitable tearing means known per se. If material suitable for the purpose is used, the tear line 8 can also be designed as a breaking line, for 30 instance when the strip 4 is formed from relatively brittle and fragile

material, whereby a local material weakening, for instance a thinning, can be provided at the breaking line. These and many comparable variations are understood to be within reach of those skilled in the art.

A package according to Fig. 1 can be used as follows.

5        From blanks 16, a suitable number of subpackages 2 are folded, which can be filled through the filling and take-out opening 30 with product to be packaged, for instance vegetables, fruit, candy or the like, or individual consumer packages such as bags, small boxes, products packed in wrappers, and the like. Prior to filling, or following filling, the subpackages 2 can be  
10      arranged in the row shown in Fig. 1 and be interconnected by gluing or otherwise securing a strip 4 thereto on opposite sides, such that in each case a surface 6 is attached to a sidewall 5, with a tear line 8 adjacent a plane enclosed between two longitudinal walls 3 placed against each other. In this filled condition, different series of subpackages 2 can be stacked onto and  
15      next to each other on, for instance, a pallet, and be transported to a store, where the series of subpackages can be displayed directly. A consumer can simply separate a subpackage 2 from a series by tearing or breaking it loose from an adjacent subpackage. To that end, for instance, the respective subpackage can be tilted with respect to the adjacent subpackage along the  
20      upper or lower line of contact between two longitudinal walls 3 placed against each other. In this way, the consumer obtains a loose subpackage 2, with a pleasant appearance and with a measured amount of product. When all five subpackages have been removed from the respective series, the  
25      retailer is not left with any packaging material, while the customer does not need to perform any time-consuming operations, such as measuring the desired amount.

The packages according to the invention follow the European packaging covenants.

Fig. 2 shows a first alternative embodiment of a package 101 according  
30      to the present invention, again starting from a series of, in particular five,

subpackages 102, with longitudinal sides 103 placed against each other, thereby forming a closed row. Again, on opposite sides of the respective row, a strip 104, forming a connecting means, has been adhered or otherwise secured, including adhesive surfaces 106 and intermediate tear lines 108. A 5 loose strip 104 is also shown in Fig. 2. In this embodiment, the subpackages have been folded from a relatively simple blank, not shown, with a bottom surface, rectangular sidewalls 103 connected to the bottom surface through first fold lines, and sidewalls 105 connected to the bottom surface through second fold lines. Through two opposite parallel fold lines, the sidewalls are 10 connected with adhesive flaps 120 through which, in the erected box, the sidewalls 105 are fixedly connected with the longitudinal walls 103. In this embodiment, each subpackage 102 has a rectangular block-shaped external shape.

Each strip 104 substantially corresponds in shape to the strip 4 as 15 shown in Fig. 1. However, in this embodiment, a substrip 111 is connected through a fold line 113 with the surfaces 106. Cutting lines 115 are provided in the strip 104, such that the supporting flaps 112 are formed. The strips 104 are secured to the series of subpackages 102, such that the fold line 113 approximately coincides with the upper longitudinal edge 114A 20 of the sidewalls 105. Thus, the substrip 111 can be flanged inwards through an angle of about 90°, as represented by the arrows P, such that it comes to lie against the upper longitudinal edges 114B of the longitudinal walls 103. Thus a surface 114 is formed that extends on opposite sides of the series of subpackages 102 and forms a supporting surface 114 for any further series 25 of subpackages 102 to be placed on the instant series. As a result of the cutting lines 115, the supporting flaps 112 will then continue to extend in a vertical sense, so that a superjacent series of subpackages 102 is thereby secured from displacement, at least in transverse direction. The substrips 111 can be folded loosely against the sidewalls 103 but they can also be 30 fixed to them. The substrips 111 at their two ends are provided with an

adhesive flap 111B, which can be fixed against the free longitudinal wall 103 of the subpackage 102 adjacent the respective end. The substrips 111 are thereby fixedly connected with the subpackages in the condition where they are folded against the upper edges of the longitudinal walls 103.

5 In the embodiment shown in Fig. 2, the tear lines 108 extend into the substrip 111. However, the substrip 111 can also be cut inwards as far as the fold line 113, such that loose substrip parts are obtained at each subpackage 102. Further, the height  $H_s$  of the substrip 111 in the embodiment shown has been selected to be smaller than half the length of 10 the longitudinal wall 103. As a result, with the substrips 111 folded down, an opening is left clear between the free longitudinal edges 111A of the substrips 111. It is also possible, however, to select the height  $H_s$  to be greater, for instance equal to half the length of the longitudinal walls 103, so that at least substantially completely closed filling and take-out openings 15 130 can be obtained. When the height  $H_s$  is selected to be so great that the substrips 111 can at least partly overlap, they can be secured onto each other. In a simple manner, this prevents the possibility of product being removed from the subpackages 2 or otherwise manipulated.

Fig. 3 shows a third embodiment of a package according to the present 20 invention, in which, again, a series of substantially rectangular subpackages 202 have been shoved against each other by their long sides 203, thereby forming a row. In this embodiment, the connecting means 204 are designed as a central part 211 extending over the entire upper side 214 of the series of subpackages 202, this central part 211 having a width 25 corresponding to the length of the longitudinal walls 203. Provided on opposite sides of the central part 211 is a strip 214A in the form of a longitudinal edge part, folded downwards along a fold line 213 against the sides 205 of the subpackages 202. Again, cutting lines 215 are provided, such that supporting flaps 212 project above the fold lines 213, for lateral 30 stabilization of a further row of subpackages 202 placed on the central part

214. In the central part 214, in the embodiment shown, openings 216 are provided, through which the packed products 217, for instance apples as in the embodiment shown, cannot pass but can be seen.

The strips 214A are subdivided into adhesive surfaces 206 by tear lines 5 208. The tear lines again lie adjacent two confronting longitudinal walls 203. In the central part 214, further tear lines 208A can be provided, which interconnect the tear lines 208 located on opposite sides, but these tear lines can also be designed as incisions such that the central part 214 is divided into separate parts 214B, each having a width corresponding to the width of 10 the subpackages 202. In such an embodiment, a subpackage 202 can be detached by tearing loose only the tear lines 208. Because the tear lines 208 in the exemplary embodiment shown extend slightly beyond the fold line 213 into the central part 214, a slightly better stabilization is obtained, while the subpackages 202 can yet be detached relatively simply.

15 Fig. 4 shows an embodiment of a package 301 according to the invention, which to some extent is comparable to the embodiment as shown in Fig. 2. In this embodiment, the strips 304 are attached by relatively small adhesive surfaces 306 to the sides 305 of the subpackages 302, with substrips 311 folded along fold lines 313 over the open upper sides 314 of 20 the subpackages 302. The substrips 311 have a height  $H_s$ , which is greater than half the length of the longitudinal walls 303, such that the substrips overlap to some extent. The overlapping parts have been glued together after filling of the subpackages or prior to placement of the strips 304. The operatively upper substrip 311A is provided with a fold line 330, such that a 25 free portion of the respective substrip 311A can be folded upwards along the fold line 317, into a plane approximately parallel to the sidewalls 305. In the upwardly folded part 311B, as shown in Fig. 4 at the central subpackage, a recess 331 is provided, by which a subpackage can be picked up relatively simply. In the substrips 311, further, openings 316 are

provided, through which the packed products 319 can be seen, but not removed.

In this embodiment, the breaking and tear lines 308 are designed as perforation lines, which extend at least through the strips 304 between 5 adhesive surfaces 306 and optionally continue between the substrips 311. However, the substrips 311 may also have already been cut loose from each other.

Fig. 5 shows a further embodiment of a package according to the present invention, in which subpackages 402 are used which correspond at 10 least substantially to the subpackage as shown in Fig. 1. In this embodiment, in each adhesive flap 428, for instance a rectangular incision has been made, to a depth slightly smaller than the thickness of the material of the blank. The incisions 432 are so positioned that when the subpackages 402 are shoved against each other in the manner shown on the 15 left in Fig. 5, the incisions 432 of two adjacent subpackages 402 face each other. The subpackages 402 are glued to each other by way of the contact parts 433, hatched in Fig. 5, extending within the incisions 432. Thus a closed, mutually connected row of subpackages 402 is obtained. Upon separation of a subpackage 402, as shown on the right in Fig. 5, a portion of 20 the contact part 433 within the incisions 432 will come off the subjacent part, in a manner as described for the tear lines in Fig. 1B, and remain attached to the other subpackage 402. Thus a pleasant appearance of each subpackage is preserved, since on the outside no glue rests become visible. Only on one of the subpackages 402, the back of the part 433 of the 25 respective adhesive flap 428 as pulled loose from the incision 432 will be visible. Such an embodiment provides the advantage that these subpackages are simple to manufacture and that no further material is necessary for the connecting means, which leads to a further reduction of the material used. Moreover, the connecting means are not visible from the 30 outside of a series of subpackages 402.

Naturally, the incisions 432 can be provided at other points, while moreover there is the possibility of providing such cuts in each case on only one side of a subpackage, while the cuts can extend through at least substantially the entire blank, at least the adhesive flap 428, such that

5 upon detachment of the subpackages, the contact part 433 extending within the incision 432 is loosened from the cut 432, whereby, through the opening then formed, the outer side of the blank part becomes visible, against which the respective adhesive flap 428 has been glued, whilst the detached contact part 433 has an outwardly facing layer such as the further blank. Thus a

10 still more pleasant appearance is preserved.

Fig. 6 shows a further alternative embodiment of a package 501 according to the invention, in which subpackages 502 as shown, for instance, in Fig. 2 have been combined into a row. The strips 504 have been glued to the subpackages 502 on opposite sides, which strips 504 comprise adhesive surfaces 506, which are affixed to the sides 505 of the subpackages 502, as well as substrips 511 which have been folded along fold lines 513 onto the upper side 514 of the series of subpackages 502 in the manner described with reference to Fig. 2. Along the length of the strips 504, a tear strip 534 has been formed by providing two tear lines 508, extending

15 parallel to each other and to the fold line 513, for instance of a kind as described with reference to Fig. 1B. The strip 504 has been cut inwards from the upper longitudinal edge 511A as far as the upper tear line 508, and from the lower longitudinal edge 506A as far as the lower tear line 508, such that the cut-loose parts of the strip 504 are mutually connected only

20 through the tear strip 534. In this embodiment, the mutually connected subpackages 502 can be detached by tearing the tear strip 534 loose along the tear lines 508, as shown in Fig. 6. Again, supporting flaps 512 are provided for laterally positioning a further series of subpackages 502 stacked onto the instant series.

Fig. 7, in top plan view, shows ten examples of open box forms suitable for forming subpackages 2-502 for use within a package 1-501 according to the present invention. The box forms as schematically shown in top plan view in Fig. 7 are shown by way of exemplary embodiments only. Such box forms are known from practice.

The box forms of types I and J are of the folding carton type. This is advantageous in that the subpackages thus formed can be simply transported in flat, collapsed condition to a user and be set up there, by hand or with simple equipment. Transport and storage thus require little space and cost, and so does the equipment needed.

In a variant not shown, the subpackages are set up in a series from a single blank, with two longitudinal sides in each case being mutually connected through a breaking or tear line. It is also possible, for instance, that in each case two subpackages next to each other, or behind each other, are folded from a single blank.

The subpackages in a package according to the present invention can also be closed consumer packages, for instance for foodstuffs, detergent and the like.

Because packages 1-501 according to the present invention consist of series of subpackages 2-502, these can be stacked onto, for instance, pallets, without any further outer package.

Figs. 8A-C represent, by way of example, stacking variants for three external dimensions of subpackages, which are represented in centimeters. In Fig. 8A, starting from a subpackage having a bottom surface of 12 x 20 cm, a series of five subpackages 2 has been formed, having an outside dimension of 20 x 60 cm. Two of such series of subpackages 2 then yield an outside dimension of 60 x 40 cm. In Fig. 8B, starting from a subpackage 2 having a bottom dimension of 15 x 20 cm, a series of four subpackages has been formed, having an outside dimension of 20 x 60 cm. Two of such series side by side have a surface area of 40 x 60 cm. In Fig. 8C, starting from a

subpackage 2 having outside dimensions of 20 x 20 cm, a series of three subpackages has been formed, having outside dimensions of 20 x 60 cm. Two of such rows yield a surface area of 40 x 60 cm. This means that two series of subpackages 2 according to Fig. 8A, two series of subpackages 2 according to Fig. 8B and two series of subpackages 2 according to Fig. 8C each have the same surface area. Three series in each case have a surface area of 60 x 60 cm, thus also enabling stacking in interlocking patterns particularly well. Moreover, series of different subpackages can be combined on a single pallet. Dimensions of 60 x 60 cm and 40 x 40 cm are particularly suitable for use with standard Euro pallets, Euro containers and the like.

Figs. 9A-C show an alternative embodiment of a package 601 according to the invention, comprising three subpackages 602A, B, C arranged in a series, mutually connected by a sheetlike element 604. This sheetlike element 604 comprises a central part 611, bounded on two opposite sides by a fold line 613 along which respective longitudinal edge parts 614A have been folded over downwards. The central part 611 covers open upper sides 614 of the subpackages 602, while the longitudinal edge parts 614A are secured to the sides 605 of the subpackages 602. The longitudinal edge parts 614A are identical on opposite sides of the series of subpackages 602.

In the sheetlike element 604 four breaking lines or tear lines 608 have been provided, preferably substantially designed as described with reference to Fig. 1B. The breaking lines or tear lines 608 extend in the central part 611 approximately parallel to each other, the two central breaking lines or tear lines 608 extending adjacent the sidewalls 603 shoved against each other, of two subpackages 602 shoved against each other. The two outer tearing lines 608 extend on the central part 611 approximately along the outer side edges of the sheetlike element 604, parallel to the sidewall 603. The outer two tear lines or breaking lines 608A have been continued into the longitudinal edge parts 614A, obliquely downwards in the direction of the lower longitudinal edge 607 of the row of subpackages, and in the direction of the contact

surface between the respective mutually abutting subpackages 602A, 602B, and 602C, 602B, respectively. This inclined part 608B of the respective tear line 608 links up with a pull tab 635 which rests in a recess 631, such that this tab 635 can be simply engaged. From said tab extends, further, a tear line part 608C, approximately parallel to the contact surface between the respective mutually abutting subpackages 602, such that this tear line part 608C links up with one of the central tear lines 608. On the central subpackage 602B, in the respective part of the longitudinal edge part 614A, two curved parts of a tear line 608D are provided, which extend from a tab 635 until they link up with the central tear lines 608. This means that between two adjacent tear lines 608 a cover 690 is provided, which covers can be individually opened by pulling same loose starting from at least one of the sides of the series after engagement of a tab 631. The cover 690 will then tear along the bounding tear lines 608. If a cover 690 is torn loose from one side, then it will, after the central part 611 and one part thereof located in a longitudinal edge part 614A have been torn loose therefrom, be able to swing about the opposite fold line 613, for releasing the opening 614, as shown in Fig. 9B. The subpackages 602A, 602B are then still mutually connected by the opposite longitudinal edge part 614A, while the central and right-hand subpackages 602B, 602C are still closed and wholly connected with each other. As appears in particular from Fig. 9B, in the tear line part 608C between the central and the outer subpackage 602B, 602A, and 602B and 602C, respectively, a slightly oval cutting line part is provided, designed as described in Fig. 1B, so that the cover 690 of the left subpackage 602A is connected with an adhesive surface 606 of the respective longitudinal edge part 614A on the central subpackage 602B. It will be clear that when the cover 690 is pulled away further, it will also be torn loose from the opposite longitudinal edge part 614A, such that the left-hand subpackage 602A comes loose from the series entirely. In a comparable manner, the central subpackage and the right-hand subpackage

602B, 602C can be opened and detached, as shown in Fig. 9C. Thus a row of subpackages has been obtained, having covers 690, which can be individually opened and can be detached from the series, while the subpackages, at least with the covers 690 closed, are mutually connected by 5 a sheetlike element 604. It will be clear that a series of subpackages according to Fig. 9A can also comprise different numbers of subpackages.

Figs. 10A-C show a further embodiment of a package 701 according to the invention, which is to some extent comparable with an embodiment 501 according to Fig. 6. In this embodiment, three subpackages 702A, B, C have 10 been shoved against each other through the box sides 703. A cover 790 folded from a rectangular blank has been fitted over the three open upper sides 714 of the subpackages 702 as shown in this embodiment. Cover side panels 711B are connected through fold lines with the central part 711 and through corner panels 714B with the sidewall panels 714A, the corner 15 panels 714B being of approximately square design and provided with a diagonal fold line such that the corner panels 714B can be folded double against the inside of the side edge panels 714A, against the sides 705 of the subpackages 702. The side edge panels 714A are connected via a first tear line 708A, which extends parallel to the fold line 713 over the length of the 20 series of subpackages, with a tear strip 734, which tear strip is connected via a second tear line 708B, extending parallel to the first tear line 708A, with three adhesive surfaces 706. The adhesive surfaces 706 are glued to the respective subpackages 702A, 702B, 702C, and are mutually separated by cuts. Preferably, the cover is connected with the subpackages in such a 25 way on both sides, but the cover 790 can also be pivotally connected on one side with the three subpackages by a fixed part (not shown), with which the further cover 790 may be connected, for instance through a tear line. The tear lines, in particular the first and second tear lines 708A, B are preferably designed as shown in Fig. 1B. After the tearing strip 734 has 30 been torn loose, as shown in Fig. 10B, the cover 790 can be swung, thereby

releasing the open upper side 714 of the subpackages 702. The subpackages 702 are then separated from each other at the front shown in Fig. 10, although naturally they may also be secured to each other in a manner as shown, for instance, in Fig. 5. If on the opposite side also the tearing strip 5 734 is torn away or the cover 790 is detached from the subpackages 702 in a different way, then, as shown in Fig. 10C, the subpackages 702 can be separated entirely from each other. In the embodiment shown, in the front of each subpackage 702 an opening 705A is recessed, so that these subpackages 702 are particularly suitable as display packages for, for 10 instance, bags or the like.

Figs. 11A-C show a still further embodiment of a package 1 according to the invention, to some extent comparable with the embodiment according to Fig. 3. As always in this application, the same or corresponding parts have the same or corresponding reference numerals, increased by a hundred 15 or multiples thereof. In this embodiment, five subpackages 802A-E have been shoved against each other in a series, which subpackages have a box shape, such as shown, for instance, in Fig. 1. Over the entire upper side 814 of the series, connecting means 804 are arranged, comprising a central part 811 which has a width corresponding to the length of the longitudinal walls 803. On opposite sides of the central part 811, a longitudinal edge part 814A 20 is folded down against the opposite sides 805 of the subpackages 802. In the central part 811, in the embodiment shown, openings 831 are provided which extend in each case from a first side of a breaking line or tear line 808 in the central part 811, while from the opposite side of the tear line 808 25 a tab 835 extends which is engageable through the opening 831. Upon the tab 835 being pulled up, the tear line 808 will be subject to tension, in particular when the adjacent central part 811 is retained, so that the tear line 808 will be torn loose. Then at least the central parts 811 of two adjacent subpackages 802, for instance 802A and 802B, will be separated 30 from each other, whereafter the respective subpackages 802A, B can be

simply detached from each other. The tear line 808 can, for instance, extend into the longitudinal edge parts 814A, so that the subpackages 802 come loose directly, but there may also be, for instance, separate connections provided adjacent the ends of the tear lines 808, at least the produced part 5 thereof in the longitudinal edge parts 814A, which connections can be, for instance, staples 804A or connections between the longitudinal wall parts 803 designed as shown in Fig. 5, relatively short tear lines 808A, as shown between the subpackages 802C and D, or comparable suitable connecting means. Naturally, more tabs 835 may be provided, which may or may not be 10 still connected with the adjacent central part of the respective cover 890. Further, again supporting flaps 812 may be provided for lateral stability. In Fig. 11B the first subpackage 802A has been individually detached from the series, while the other four subpackages have been detached in two pairs, viz. subpackages 802B and C and subpackages 802D and E. Naturally, the 15 subpackages can also be individually detached. Fig. 11C shows a variant for the subpackage 802E, where in the central part 811 a further tear line 808B has been provided, for instance parallel to the longitudinal direction of the series, such that when the central part 811 is torn loose along the tear line 808B, the parts then obtained can be swung along fold lines 813 between the central part 811 and the two respective longitudinal edge parts 814A, 20 for releasing the open upper side 814 of the subpackages 802.

Figs. 12A and B show a package 901 according to the invention comprising a series of subpackages which are mutually connected by strips 904, forming connecting means, on opposite sides of the subpackages 902. In 25 construction, these strips 904 largely correspond to those as shown in Fig. 6, but here they are used with subpackages 902 closed in themselves, for instance for consumer goods, such as candy or the like, or for coupling outer boxes in which consumer packages can be received. Again, a tear strip 934 is connected through tear lines 908, perforation lines, weakening lines or 30 the like, with adhesive surfaces 906, which have been glued to the sides of

the subpackages, the adhesive surfaces 906 being mutually separated by cuts 908A. As shown in Fig. 12B, the tear strips 934 can be pulled away in the direction P for releasing the individual subpackages. It will be clear that subpackages can be connected with such strips as connecting means in a 5 comparable manner at the upper side and/or underside.

Figs. 13A-C, furthermore, show a further embodiment of a package 1001 according to the invention, with a tear strip 1034 provided on opposite sides of a series of subpackages 1002. Each tear strip 1034 is provided with a series of cuts 1038 at least substantially closed in themselves. Within the 10 cuts 1038 substantially closed in themselves, a material part 1037 is enclosed which is secured, in particular glued, to the sidewalls 1005 of the subpackages 1002. The further tear strip 1034 is connected with the subpackages 1002 through the material part 1037 mentioned.

As shown in Fig. 13B, the tear strip 1034 can be pulled away in the 15 direction P, giving rise to tearing between the tear strip 1034 and the material 1037 enclosed by the cut 1038 substantially closed in itself. As a result, a material portion 1037, circular in the embodiment shown, remains behind on the side 1005 of the subpackage 1002, while the tear strip 1034 can be simply pulled loose entirely to obtain individual subpackages 1002. 20 Surprisingly, it has been found that as a result, even in the case of relatively small adhesive surfaces, a very good connection of the subpackages 1002 can be obtained, while a pleasant appearance of the subpackages 1002 is preserved when the tear strips 1034 have been pulled away.

25 The cuts 1038, as shown in Fig. 13C, may partly cut through the tear strip 1034, so that they are not visible from the outside, but they can also, at least locally, cut through the tear strip 1034 completely, for instance as perforation or cutting line, thereby leaving no or only slight bridges between the enclosed material 1037 and the further tear strip 1034. Upon the tear 30 strip 1034 being torn loose, the enclosed material 1037 will then remain

behind on the subpackage 1002, having as an outer surface a portion of the outer surface of the tear strip, having thereon preferably a printing suitable for the subpackage 1002, which may also contain, for instance, a price indication, bar code, trading stamp or the like.

5 Subpackages according to the invention can be combined into series prior to, during and after filling. When this is done after filling, the advantage achieved is that a great freedom is obtained for composing the series, so that they can be individually formed, depending on, for instance, buyer preferences, advertisements, campaigns, and the like. Thus a great 10 freedom is obtained in the distribution chain, the more so since combining the subpackages can also take place in a distribution center or the like, for instance a supermarket, which additionally allows subpackages from different manufacturers to be combined into a series.

15 The invention is not in any way limited to the exemplary embodiments presented in the description and the drawings. Many variations thereof are possible within the scope of the invention.

Thus, the connecting means, such as for instance the strips, can be made of a relatively brittle material, such that the tear lines can be 20 designed as breaking lines, such as local thinning or weakening. Suitable material for that purpose may be, for instance, material based on starch, paper pulp or the like. Naturally, the connecting means can be designed without supporting flaps, so that stacking in interlocking patterns is further simplified, or the supporting flaps can be designed such that they, when the 25 series of boxes are stacked in an interlocking pattern, are received between mutually abutting longitudinal walls of a superjacent series. The connecting means are preferably glued to the subpackages, but other jointing techniques can also be used, such as stapling, sealing and the like. In the exemplary embodiments shown, subpackages open at the top are shown, optionally closed by means of the connecting means. It will be clear, 30 however, that also subpackages closed in themselves or subpackages with

loose covers can be used within packages according to the present invention. Naturally, the central parts as shown in Fig. 3 and the substrips as shown in, for instance, Fig. 4 can also be made of closed design. In the embodiment shown in Fig. 6 the tear strip may be glued to the subpackages but 5 preferably it lies loosely against them, being connected solely by way of the tear lines with the adhesive flaps 506 which are glued to the subpackages. This prevents the sides of subpackages from being damaged when the tear strip is being torn loose.

In each of the exemplary embodiments shown, a series of four or five 10 subpackages is shown. It will be clear, however, that more or fewer subpackages can be included in one series, while within a package according to the present invention two series of subpackages may be arranged side by side, with the series being mutually connected, for instance, in a manner comparable to that described in Fig. 5.

15 These and many comparable variations are understood to fall within the scope of the invention.

## CLAIMS

1. A package for, in particular, loose, at least detachable, products such as consumer products, which package is substantially manufactured from sheetlike material, comprising a series of subpackages which are arranged in at least one row and are mutually connected on at least one side by connecting means, which connecting means comprise, at least determine tear lines or breaking lines along which the connecting means can be broken for separating from each other and individualizing at least two subpackages arranged next to each other.  
5
2. A package according to claim 1, wherein the connecting means comprise, at least on one side of the row, a strip of material, which is secured to the respective sides of the subpackages arranged in the row, in which at least one strip tear lines or breaking lines are provided, preferably in each case adjacent the contact surface between two subpackages.  
10
3. A package according to any one of the preceding claims, wherein the or each tear line or breaking line comprises a cut on opposite sides of the sheetlike material in which it is provided, which cuts are provided in a slightly staggered relation with respect to each other, and have a depth which is at least slightly smaller than the thickness of the respective sheetlike material, such that upon tearing or breaking loose at the respective tear line or breaking line the material between the respective cuts will come loose along a plane extending substantially parallel to and between the outer surfaces of the respective sheetlike material.  
15
4. A package according to any one of the preceding claims, wherein the subpackages in the row are connected on at least two opposite sides by the connecting means.  
20
5. A package according to any one of the preceding claims, wherein the subpackages are connected at least at the upper sides by the connecting means.  
25

6. A package according to claim 4 or 5, wherein the connecting means comprise a sheetlike element, of which two opposed longitudinal edge parts are folded over in the same direction, the surface located between the longitudinal edge parts extending along the upper side of the row of 5 subpackages, and the longitudinal edge parts being secured to two opposite sides of the subpackages for forming a row of mutually connected subpackages.

7. A package according to claim 6, wherein the tear lines or breaking lines are provided in at least the longitudinal edge parts.

10 8. A package according to claims 6 or 7, wherein the tear lines or breaking lines extend over at least one of the longitudinal edge parts and said surface located between the longitudinal edge parts, such that for each subpackage a cover is provided in said sheetlike element, while during use, by opening a cover, one of the subpackages is separated from the series.

15 9. A package according to any one of claims 6-8, wherein in one of the edge parts a tear strip is provided, connected with the further edge part through at least one tear line or breaking line, which tear strip extends over the sidewalls of at least a portion of the series of subpackages, while the tear strip is connected through the at least one tear line or breaking line with a 20 number of adhesive surfaces, which adhesive surfaces are secured to the individual subpackages, while after the tear strip has been torn loose along the at least one tear line or breaking line, said surface between the two edge parts is pivotable for releasing the upper sides of the subpackages, whereafter said surface together with the parts of the edge parts connected therewith can 25 be detached from the subpackages for separating the individual subpackages from each other.

10. A package according to any one of claims 6-9, wherein the surface extending between the edge parts is provided with at least a portion of the tear lines or breaking lines, extending approximately at the contact surfaces 30 between subpackages arranged against each other, while in a central part of

said surface each tear line or breaking line is provided with a pull tab which is pivotable at least partly from said surface and with which the tearing loose of the respective tear line or breaking line can be initiated.

11. A package according to any one of the preceding claims, wherein 5 adjacent subpackages with longitudinal edges located adjacent an upper side lie against each other in the at least one row, while the connecting means are so arranged that upon pivoting of one of the subpackages relative to an adjacent subpackage along said longitudinal edge the connecting means are broken at least substantially along the or each respective tear line or breaking 10 line, such that the pivoted subpackage comes at least substantially loose from the adjacent subpackage.
12. A package according to claim 11, wherein the tear lines or breaking lines extend in connecting means located on opposite sides of the row, in a plane approximately at right angles to said longitudinal edges.
13. A package according to any one of the preceding claims, wherein the 15 subpackages are provided with corner reinforcements, preferably integrally folded legs and support surfaces along at least two upper longitudinal edges, such that a number of packages are stackable.
14. A package according to any one of the preceding claims, wherein the 20 subpackages have a ground surface of a length and width such that the rows formed therefrom are fittingly stackable on a Euro pallet or Euro container or like standardized outer package.
15. A method for packaging products, in particular natural products such 25 as vegetables, fruit or flowers, wherein subpackages are erected from one or more blanks, which subpackages are filled via an open side with the products to be packaged, wherein the subpackages are arranged in at least one row and are mutually connected by means of connecting means, in particular strips of substantially sheetlike material such as cardboard, wherein at least in the connecting means tear lines or breaking lines have been or are provided, 30 which are positioned adjacent a contact surface of two subpackages standing

next to each other in the row, such that the subpackages can be picked up jointly as a package and be transported, wherein the subpackages can be simply separated from each other by breaking the respective tear lines or breaking lines, at least the connecting means.

5 16. A method according to claim 15, wherein the connecting means are folded from a sheetlike blank, whereby two longitudinal edge parts of the blank are flanged in the same direction along respective fold lines, while the central part located between the fold lines is positioned over the open sides of the subpackages arranged in the row, while the longitudinal edges are  
10 secured to the sides of the row of subpackages, and the tear lines or breaking lines are provided at least in the longitudinal edges.

17. A method according to claim 16, wherein the fold lines are designed as perforation lines or like weakenings, such that the central part can be simply pulled loose from the longitudinal edges without the subpackages thereby  
15 being separated from each other.

18. A method for presenting products, in particular consumer products, in a store or like establishment, wherein a row of subpackages, mutually connected by connecting means which enable a simple mutual separation of the subpackages by tearing or breaking, is arranged in the store, with each  
20 subpackage containing an individual portion of the product in question, while by a consumer the number of portions of the respective product as desired by him can be taken along by tearing or breaking loose the respective number of subpackages from the respective row.

19. A method for presenting products, wherein on the basis of needs of  
25 buyers subpackages with different contents are combined into a series of subpackages, mutually connected, whereby the subpackages are combined into a package according to any one of claims 1-14.

20. A blank suitable for setting up at least one subpackage for use in a package or method according to any one of the preceding claims.

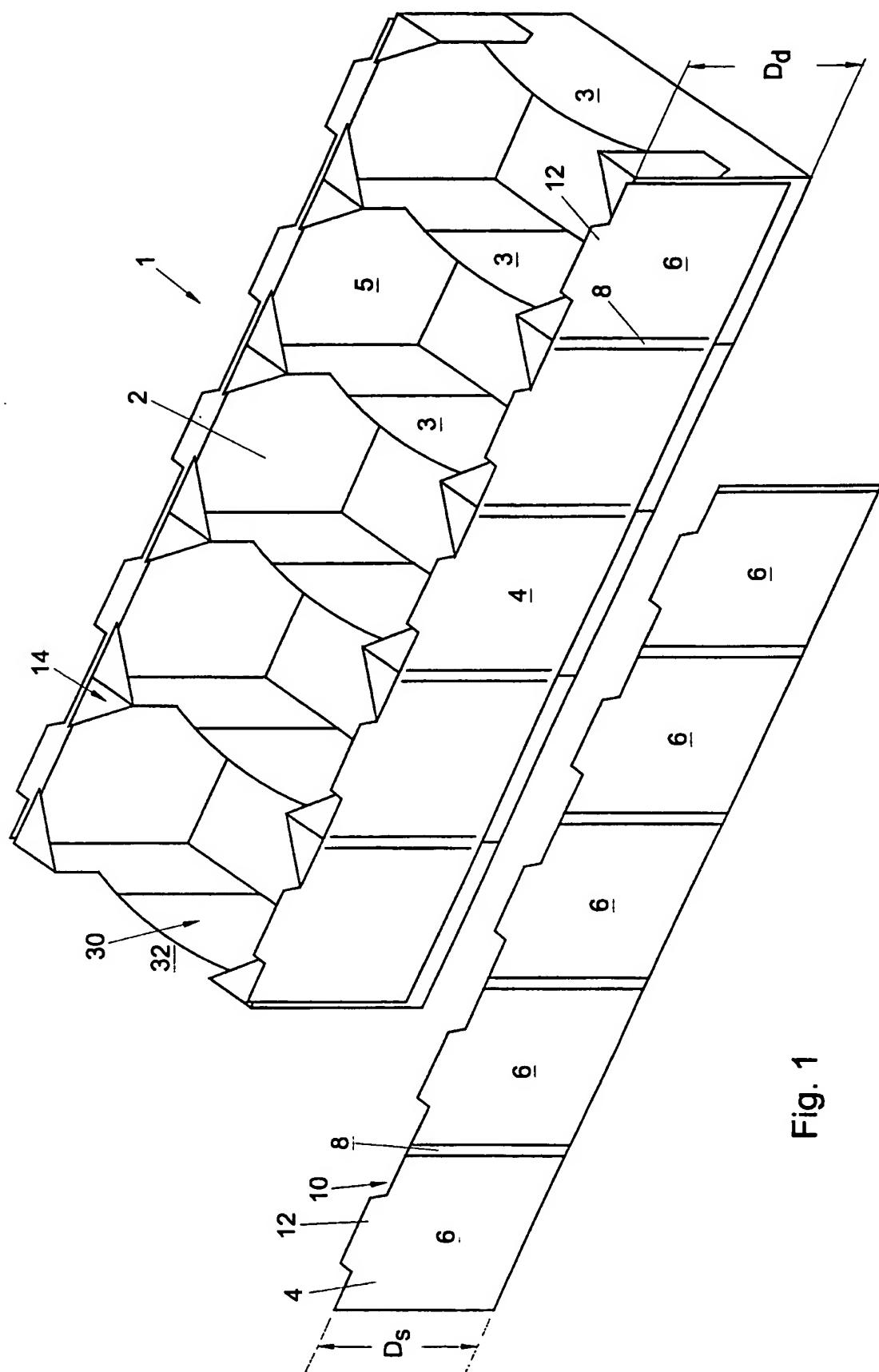


Fig. 1

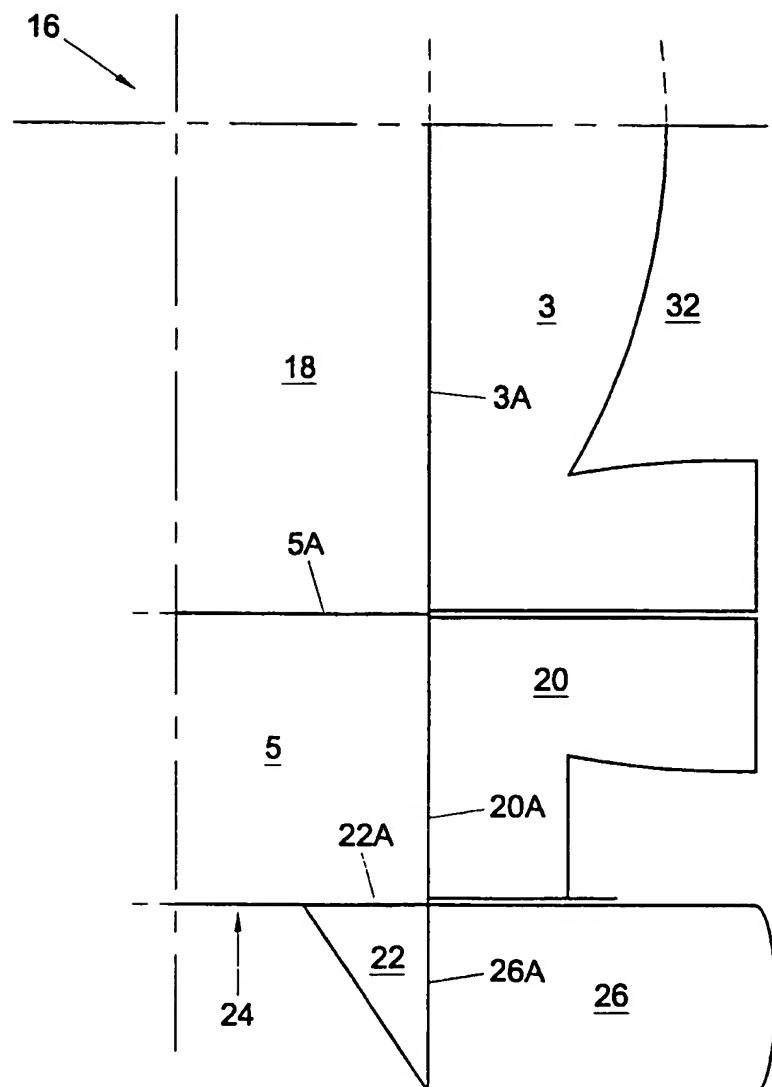


Fig. 1A

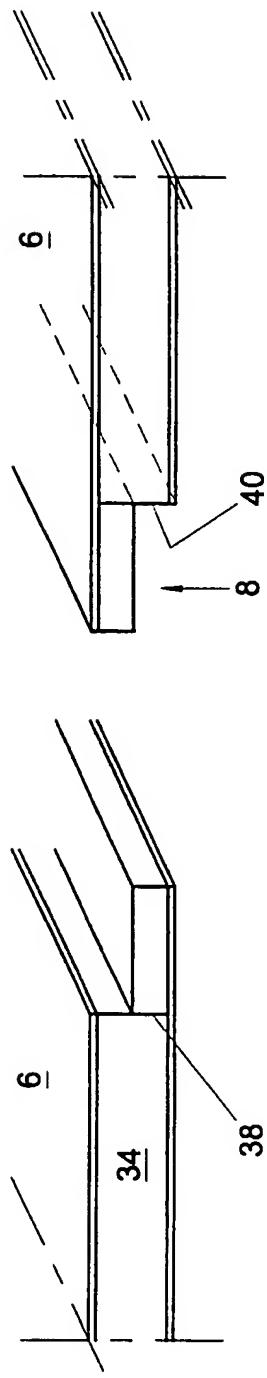
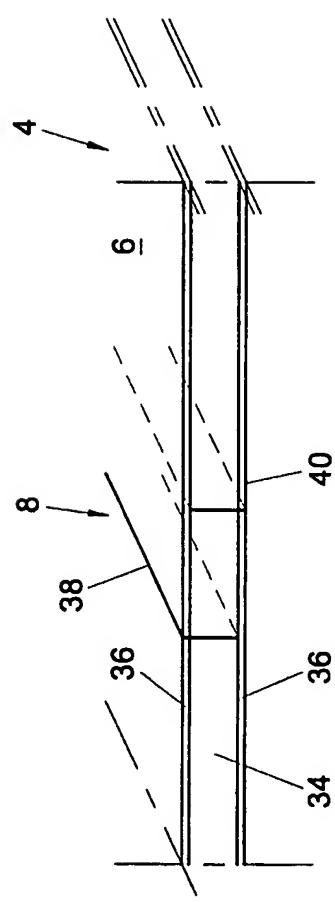


Fig. 1B

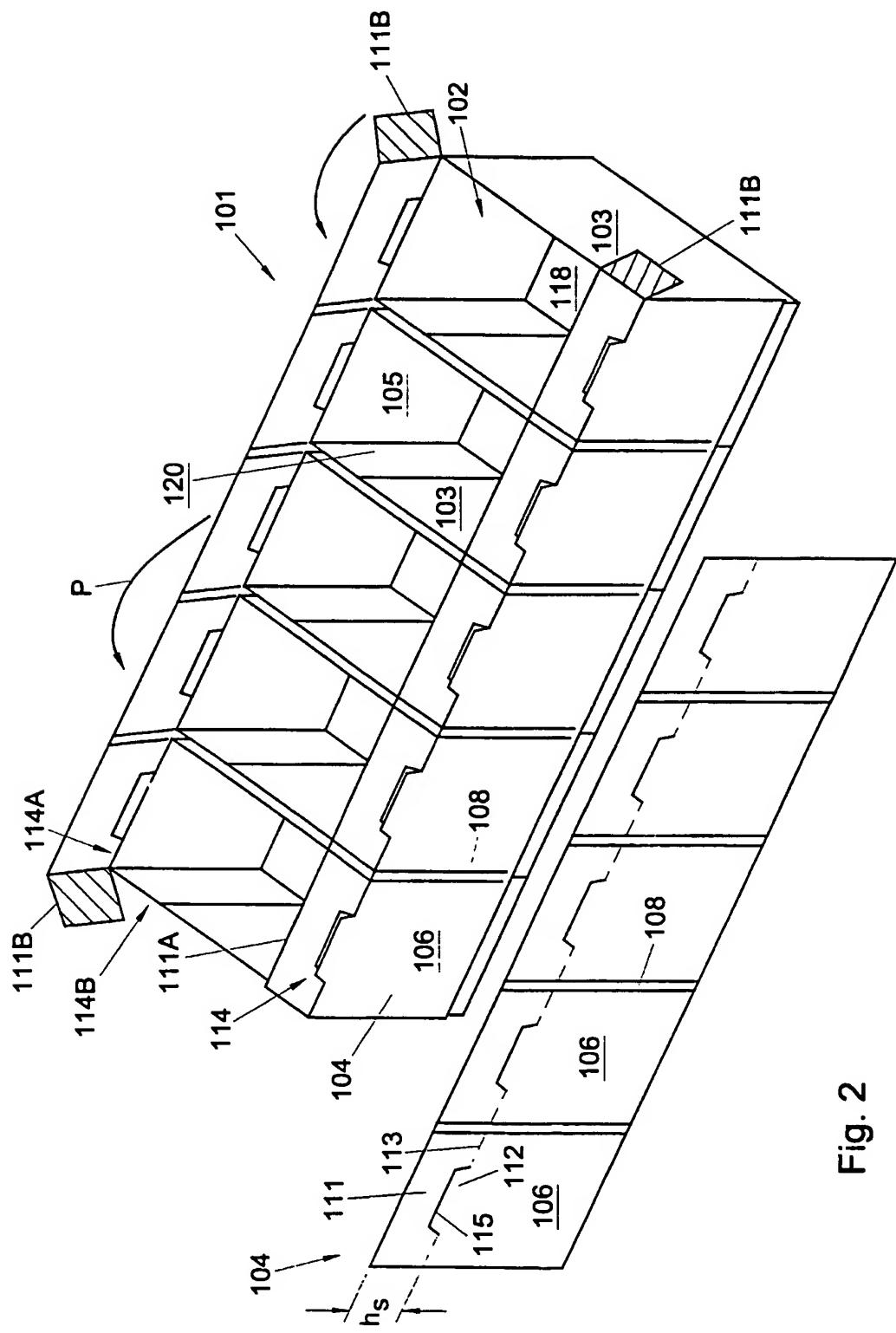


Fig. 2

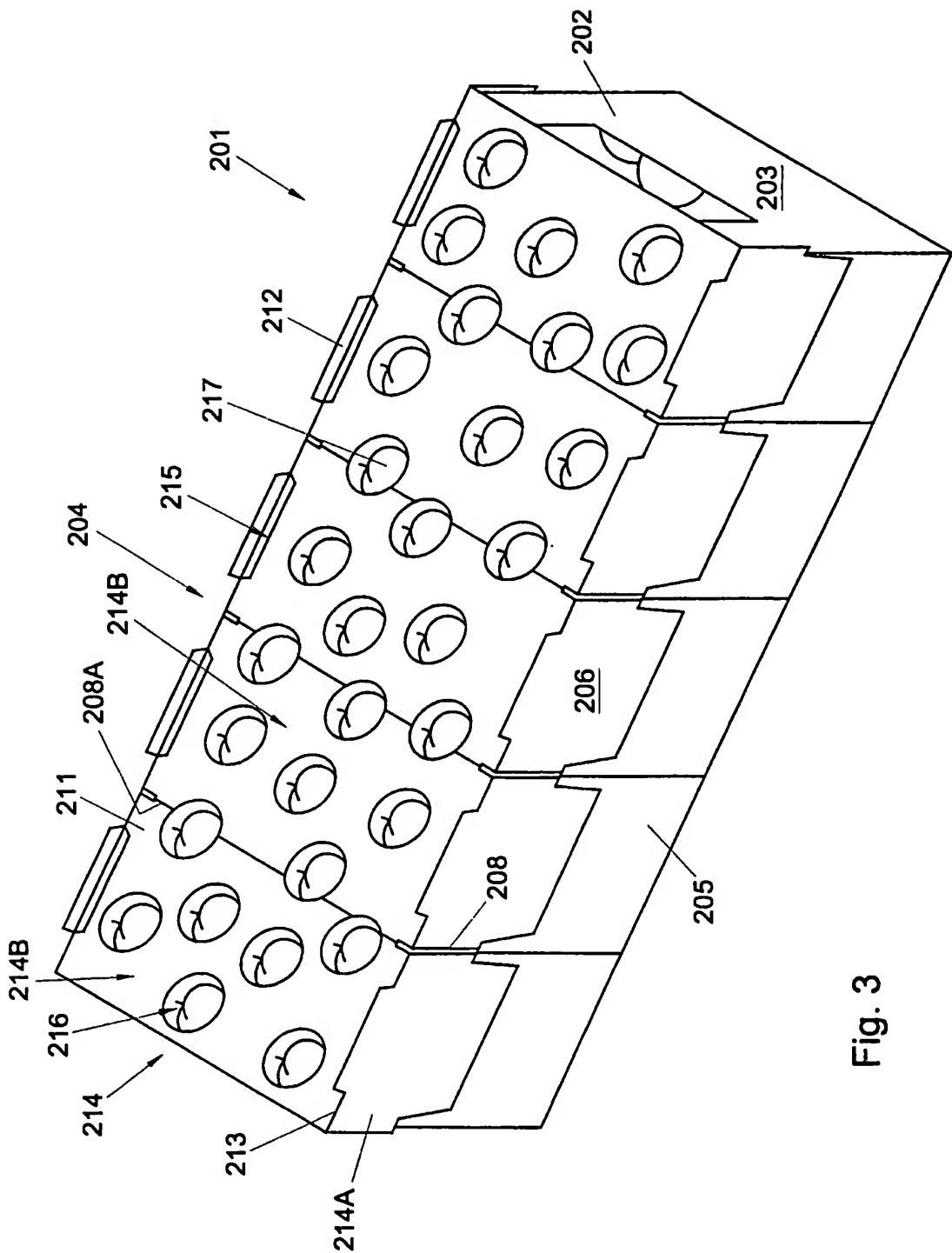


Fig. 3

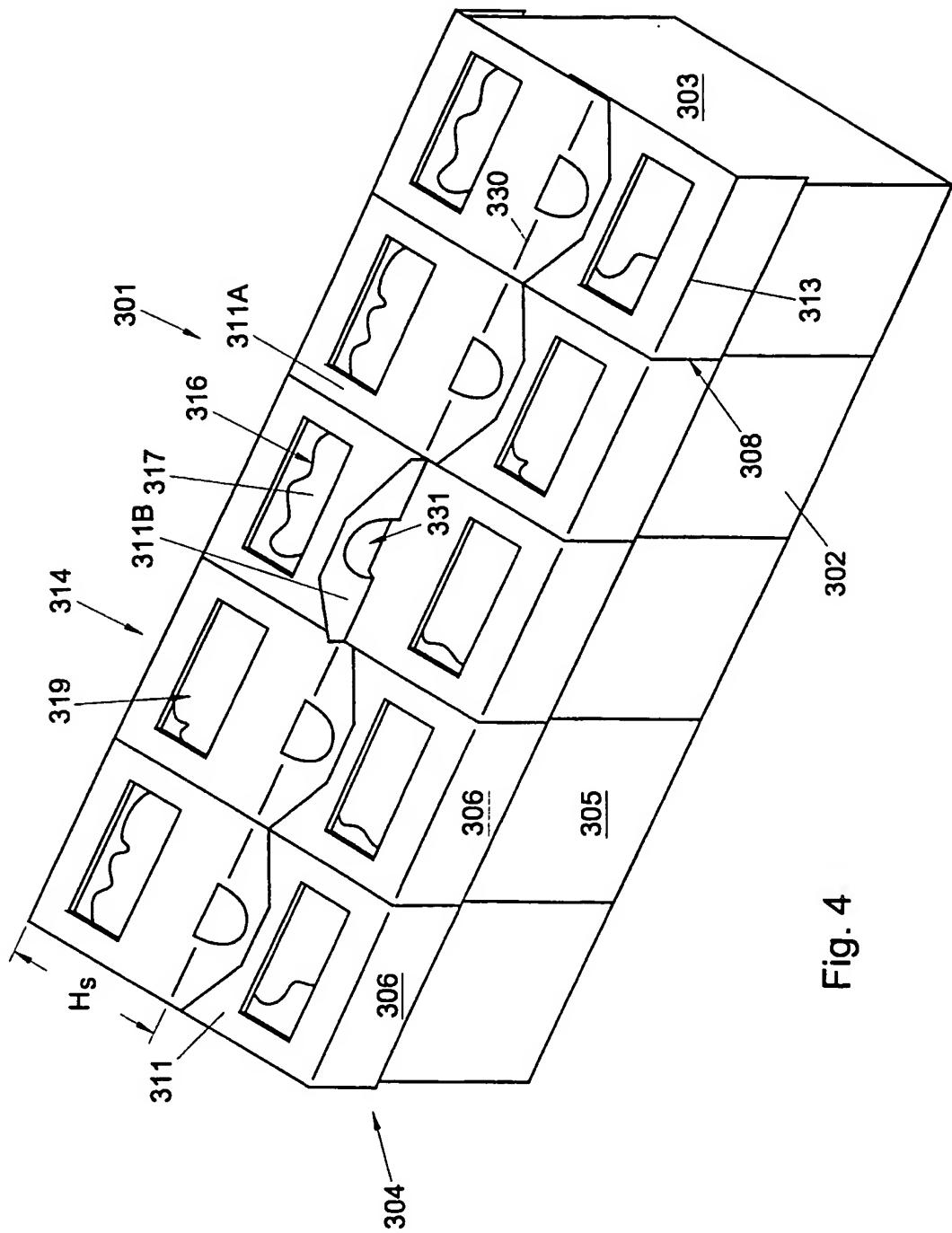
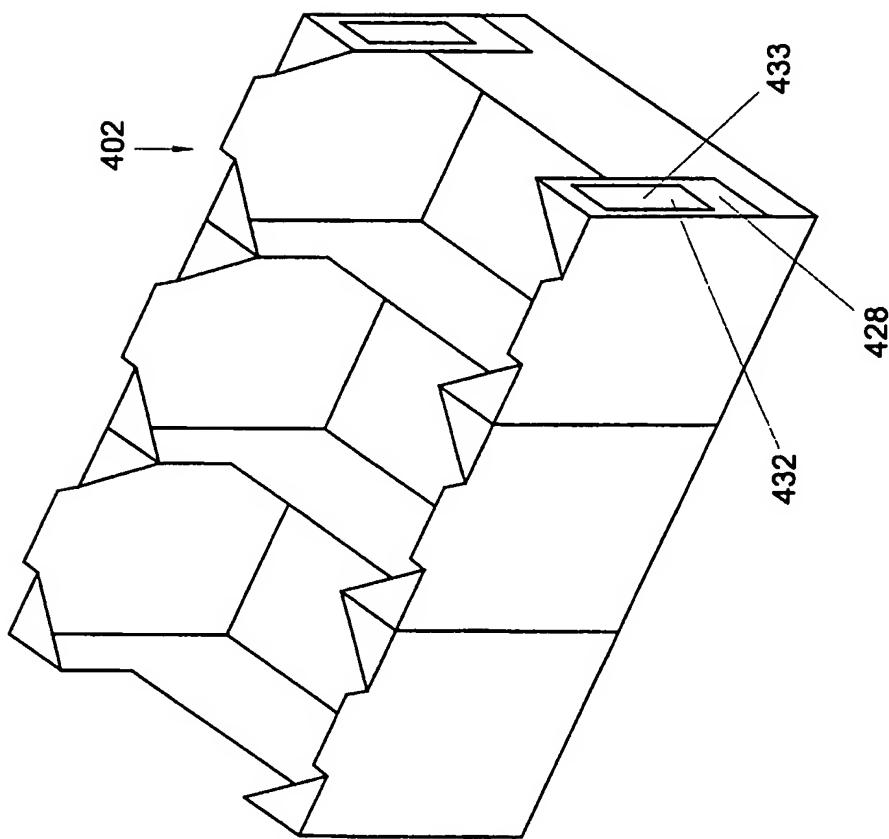
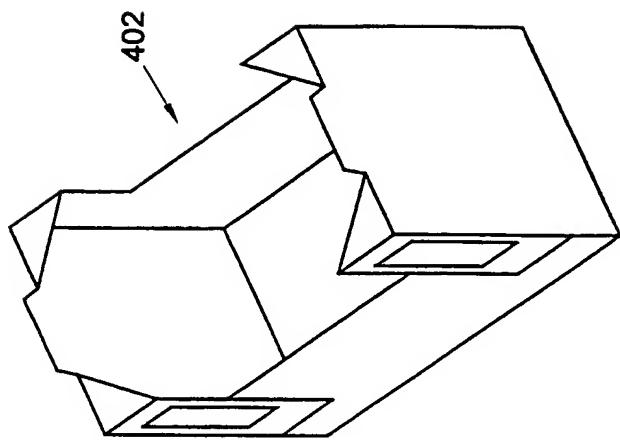


Fig. 5



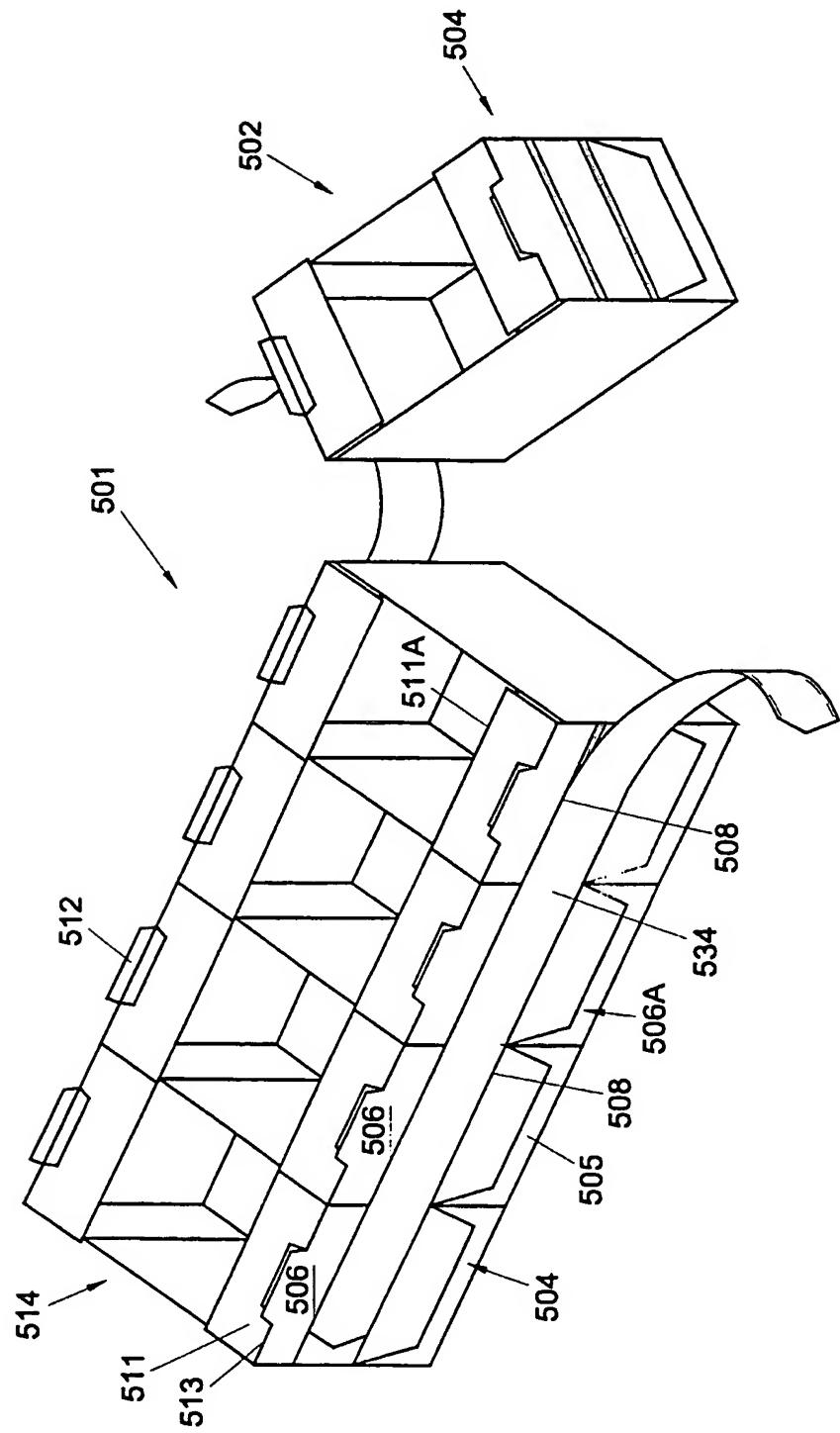


Fig. 6

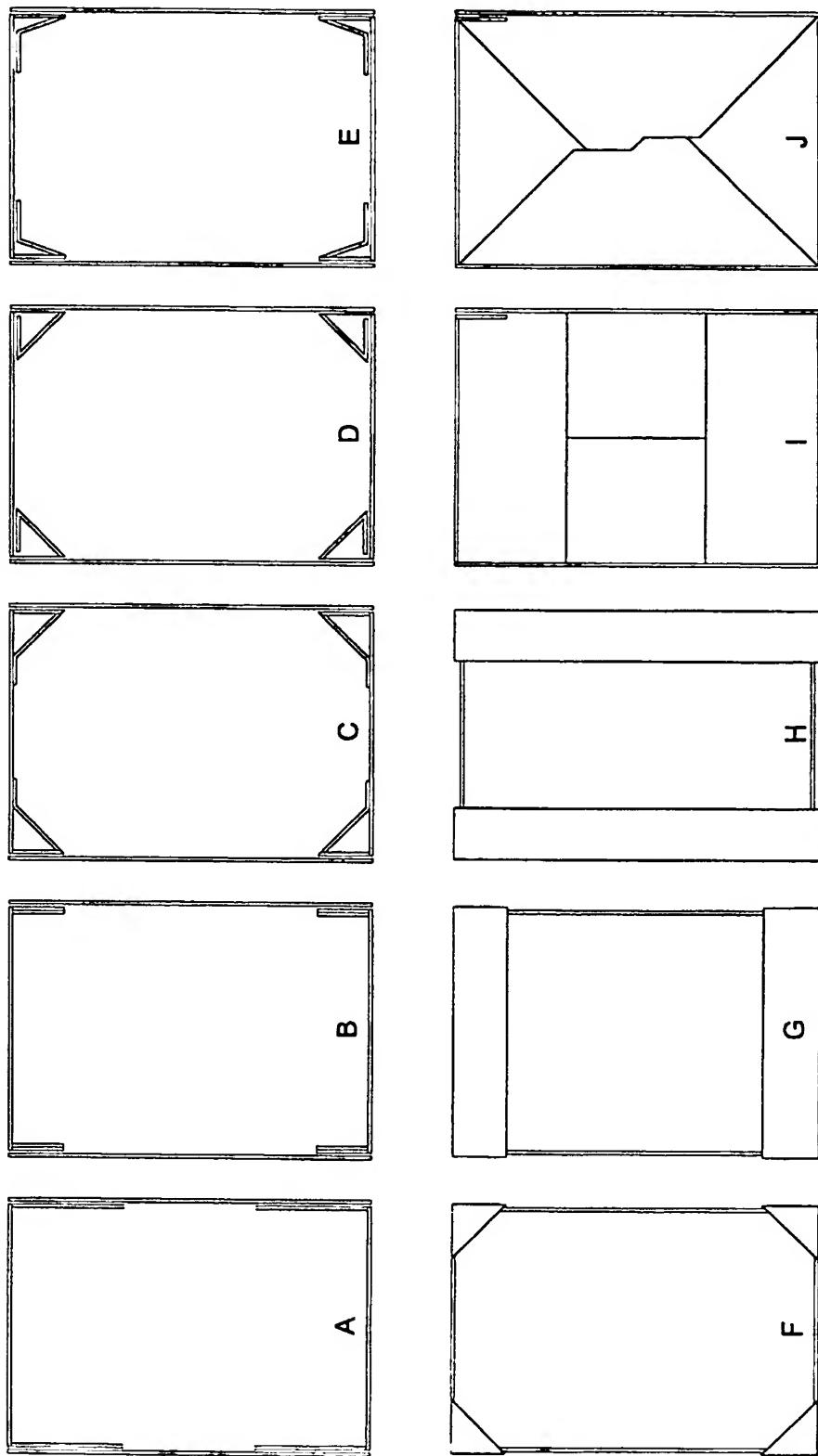


Fig. 7

Fig. 8A

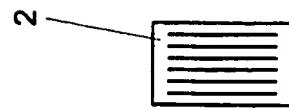
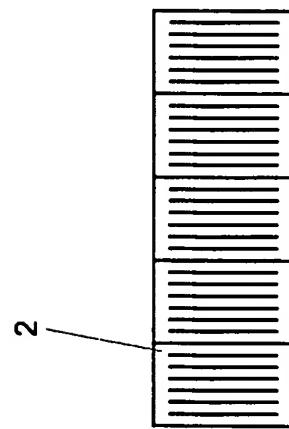
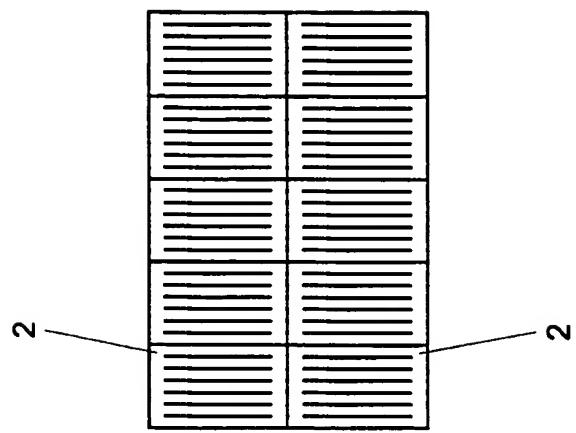


Fig. 8B

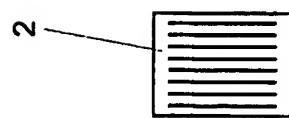
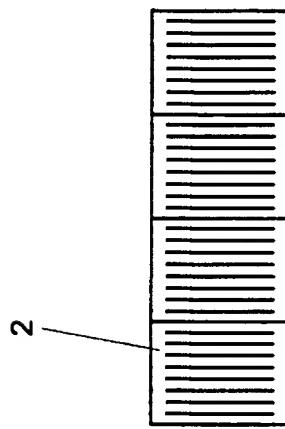
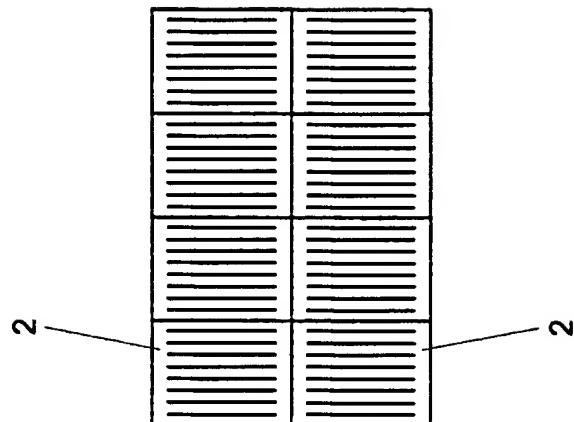
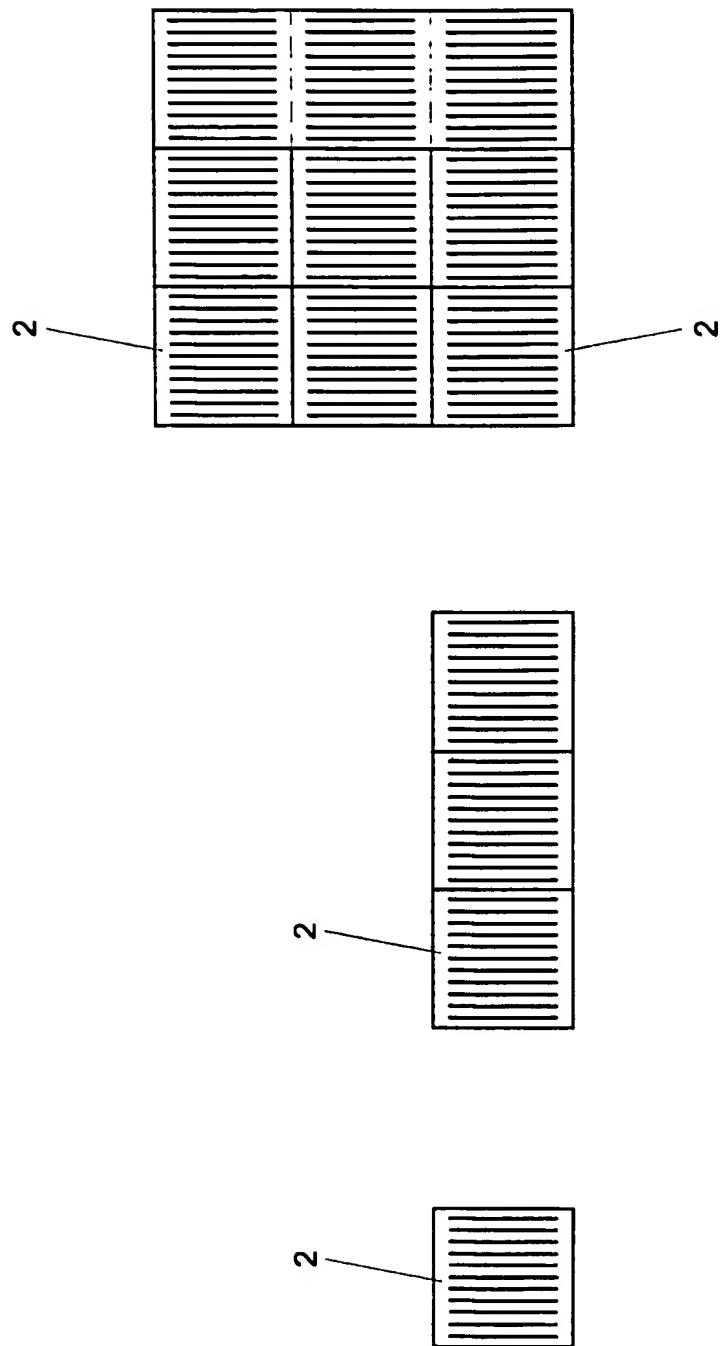


Fig. 8C



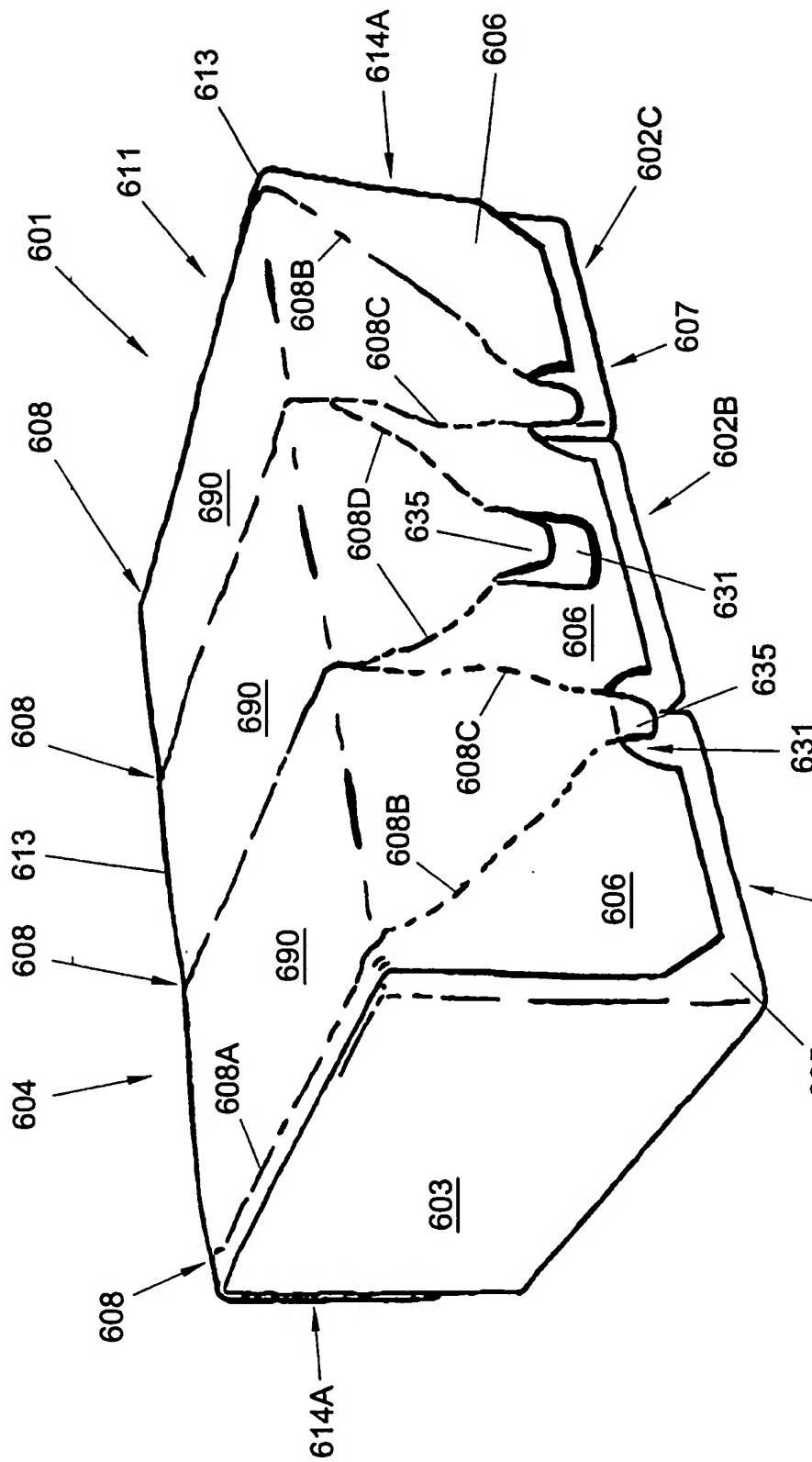
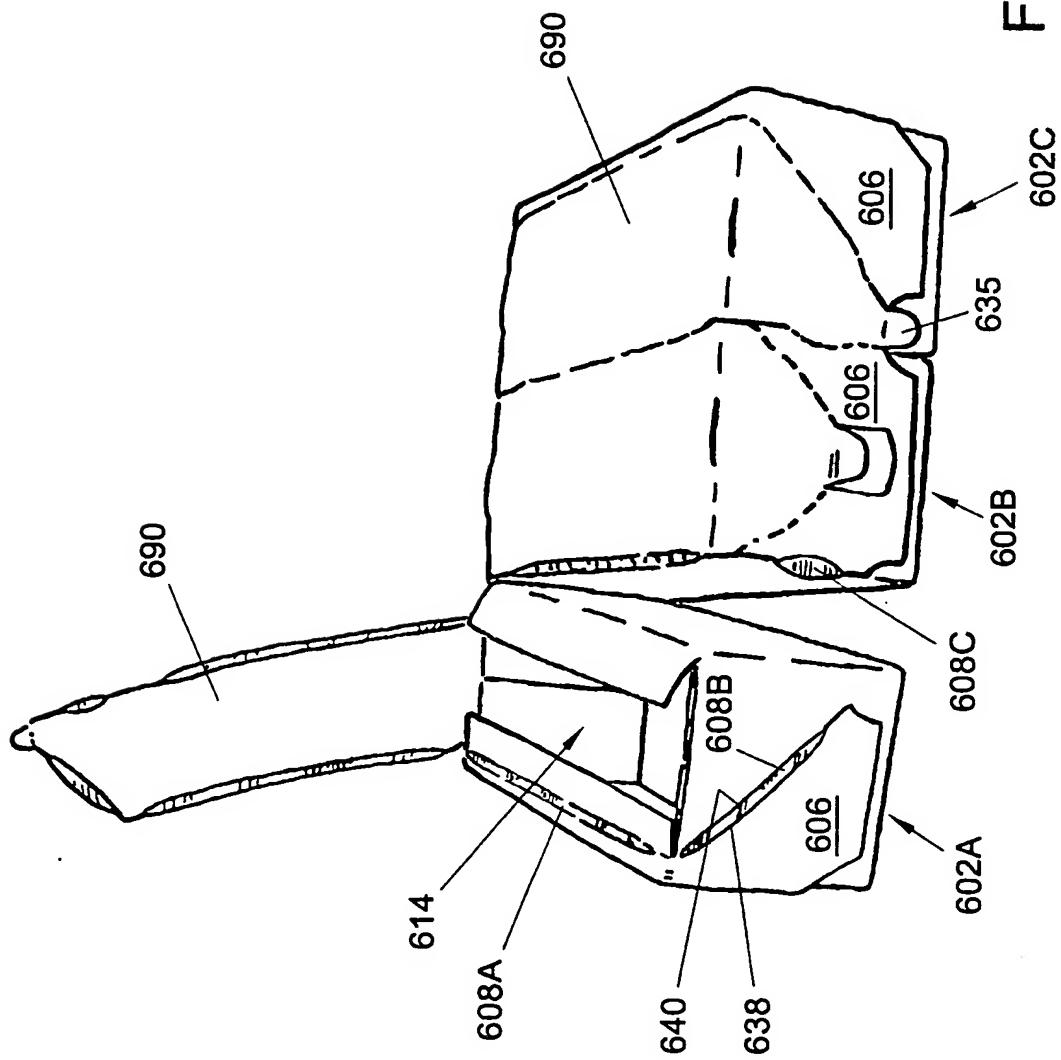


FIG. 9A

FIG. 9B



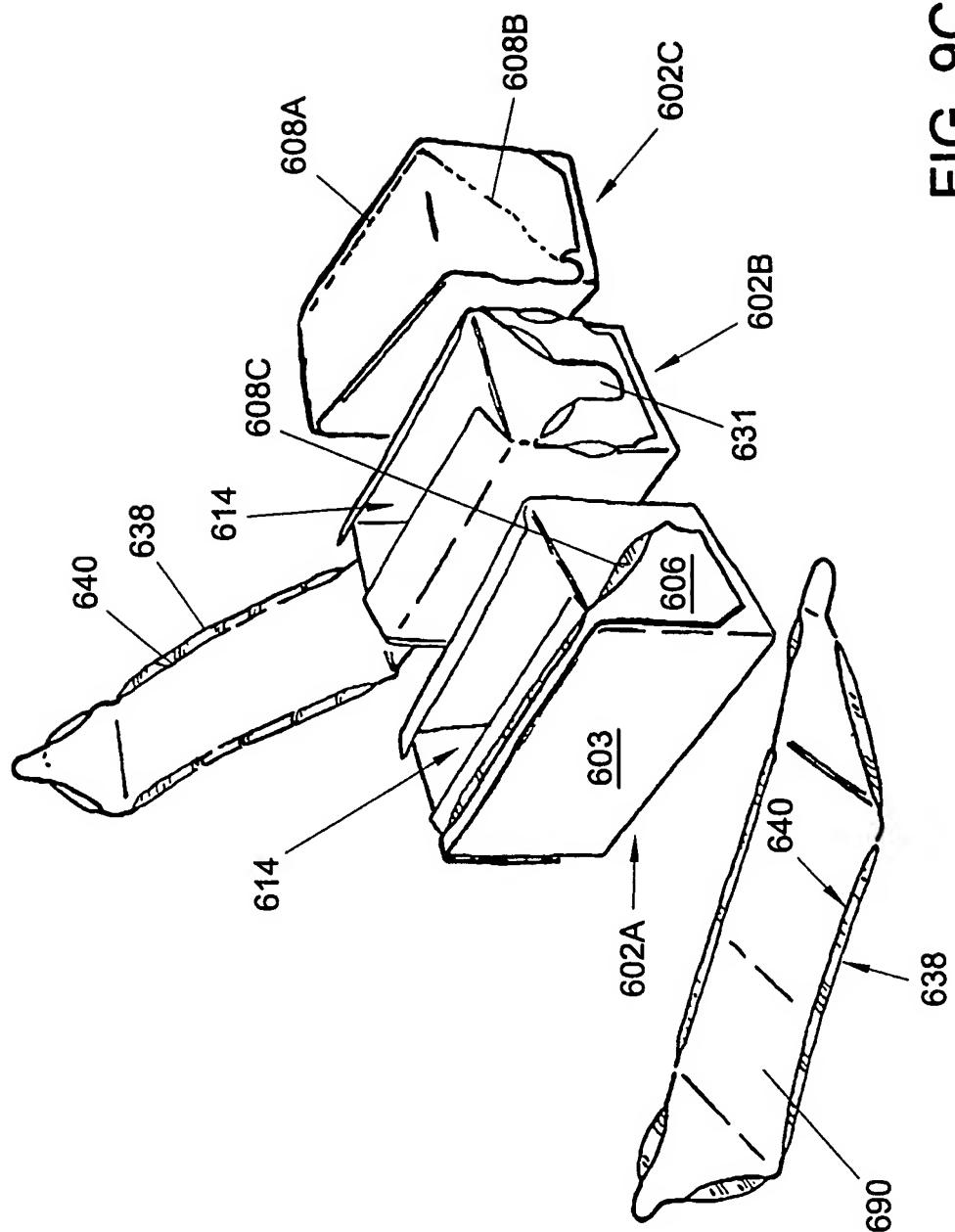
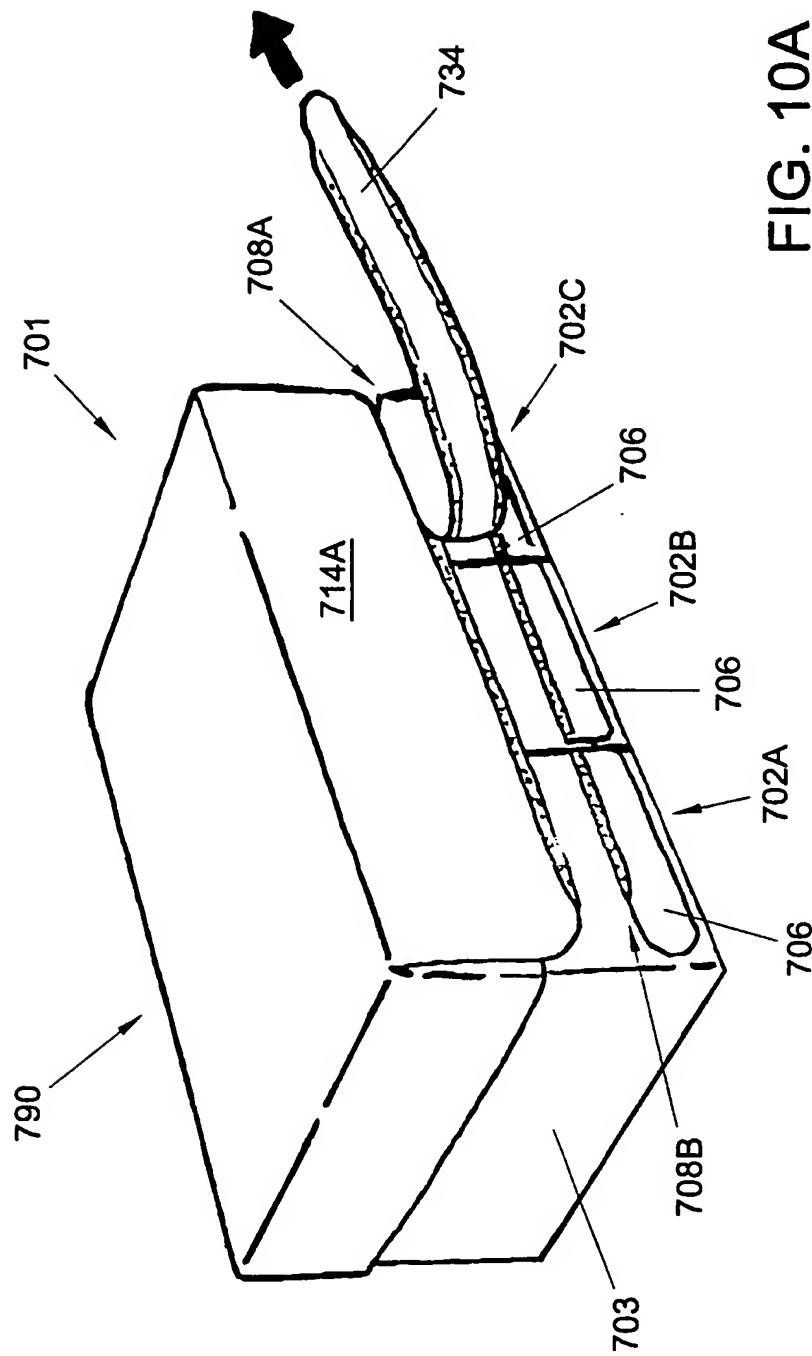


FIG. 9C

FIG. 10A



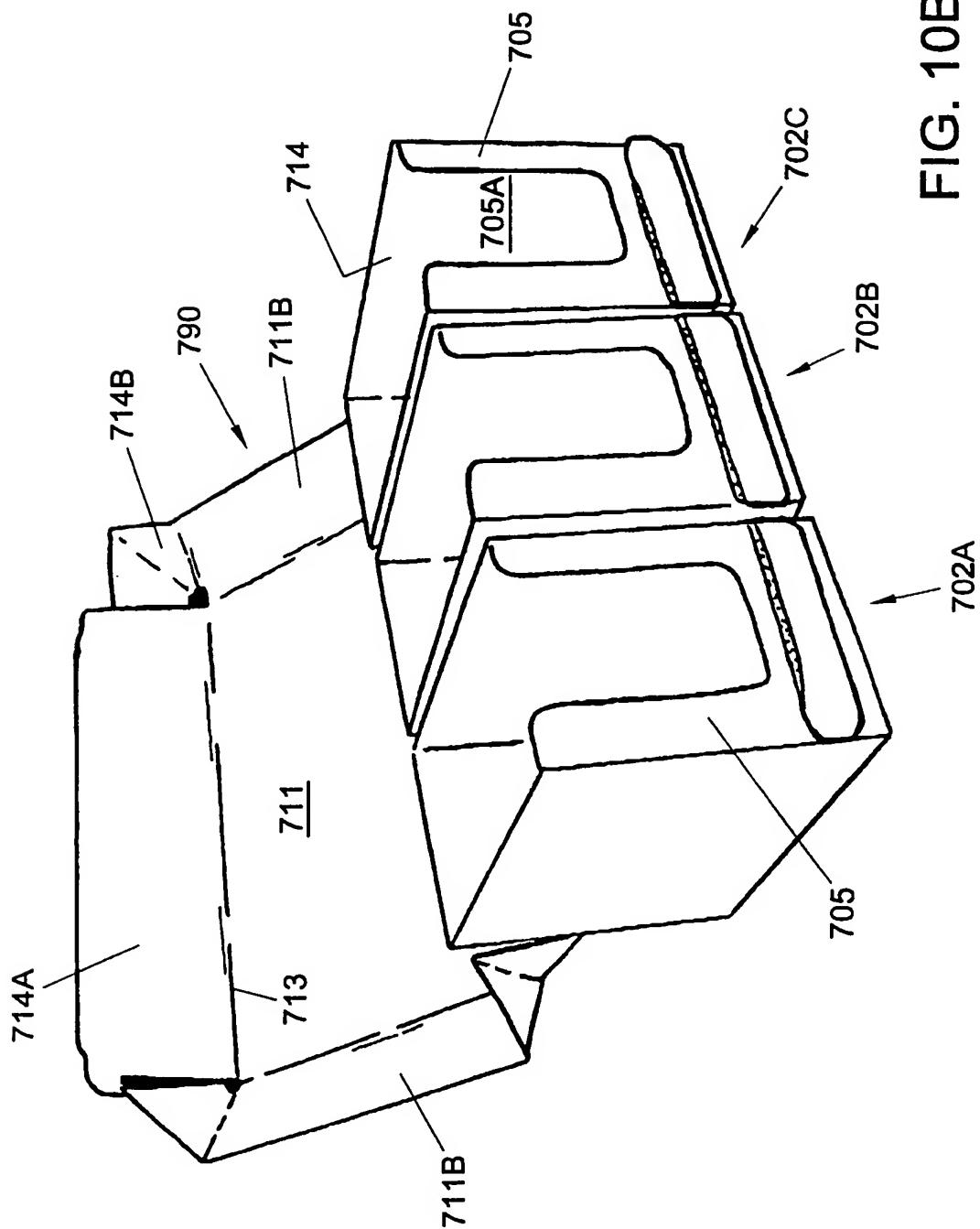
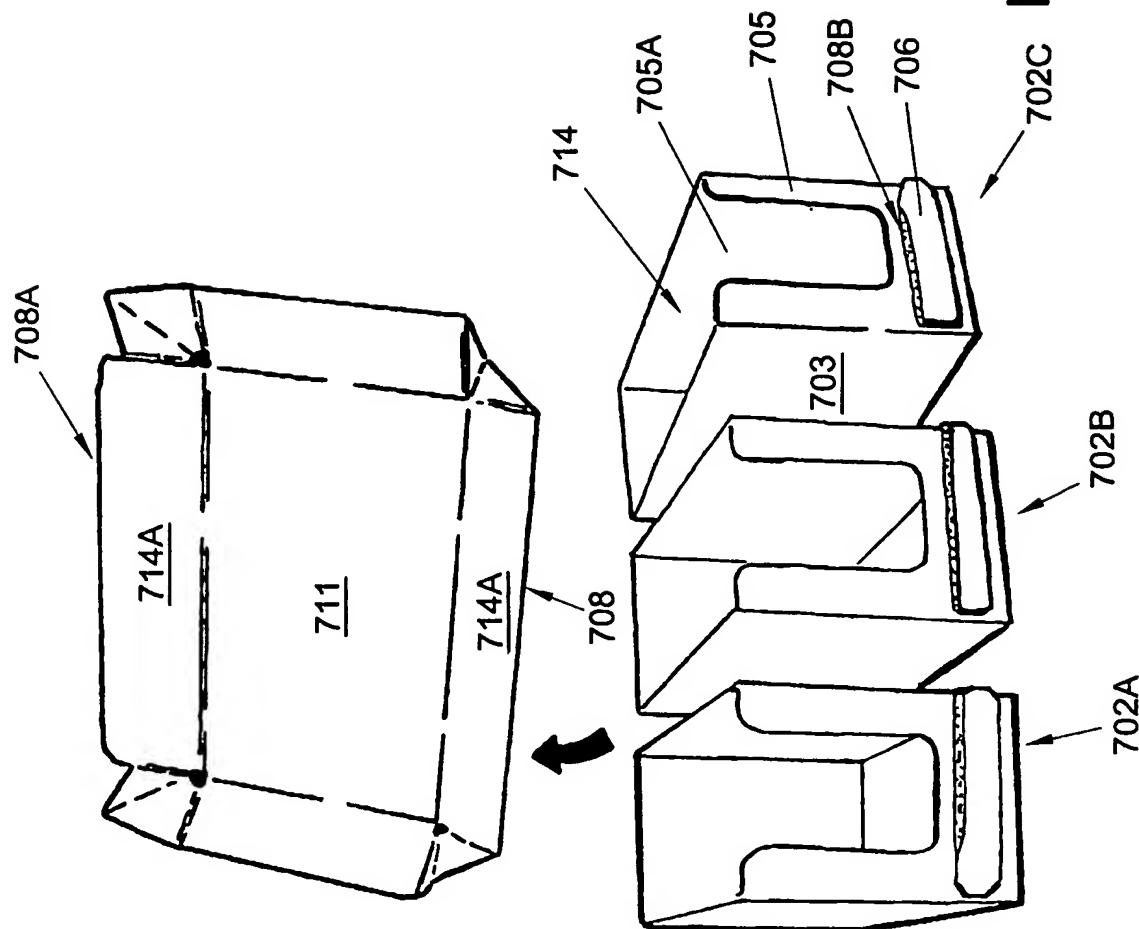


FIG. 10C



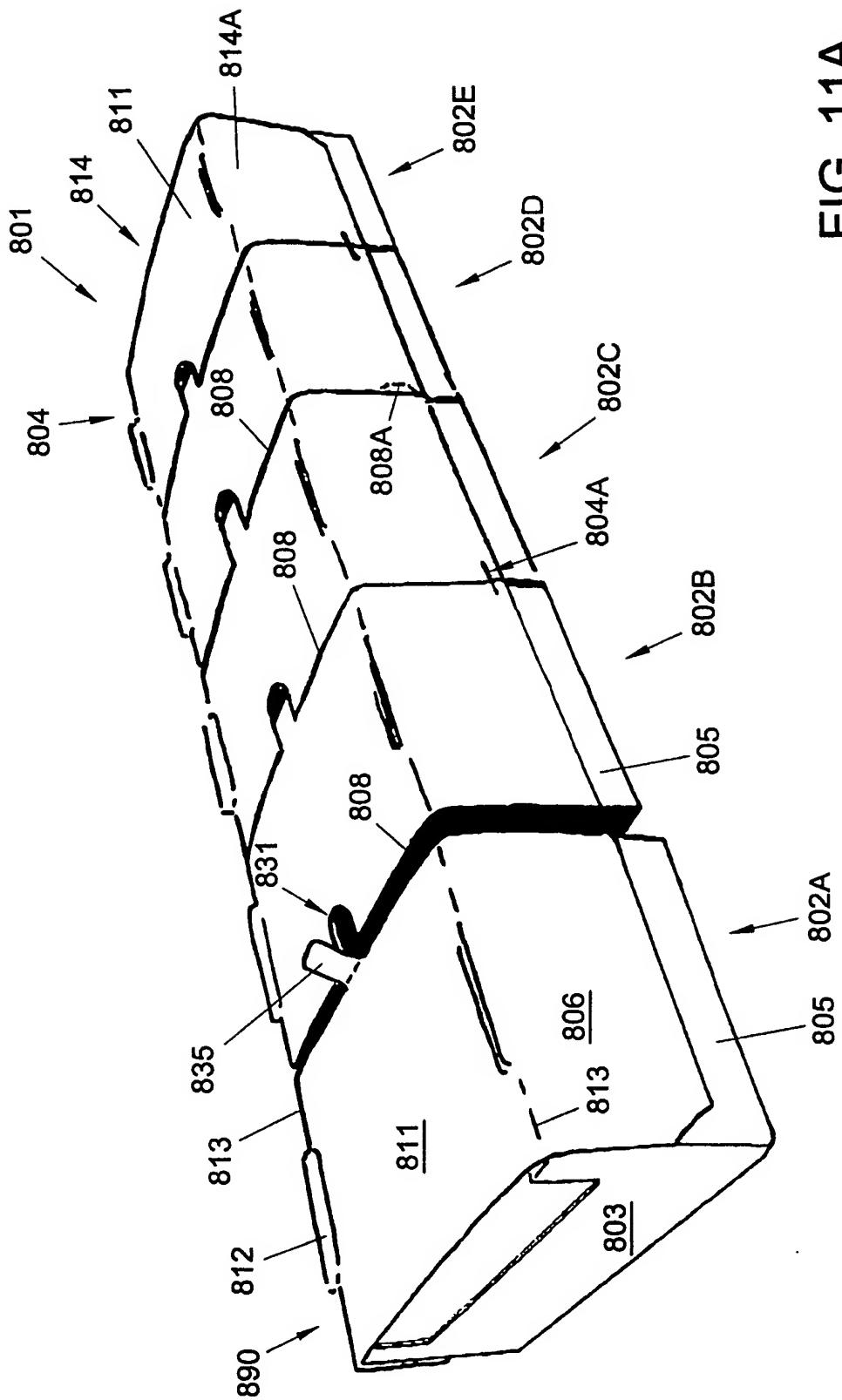
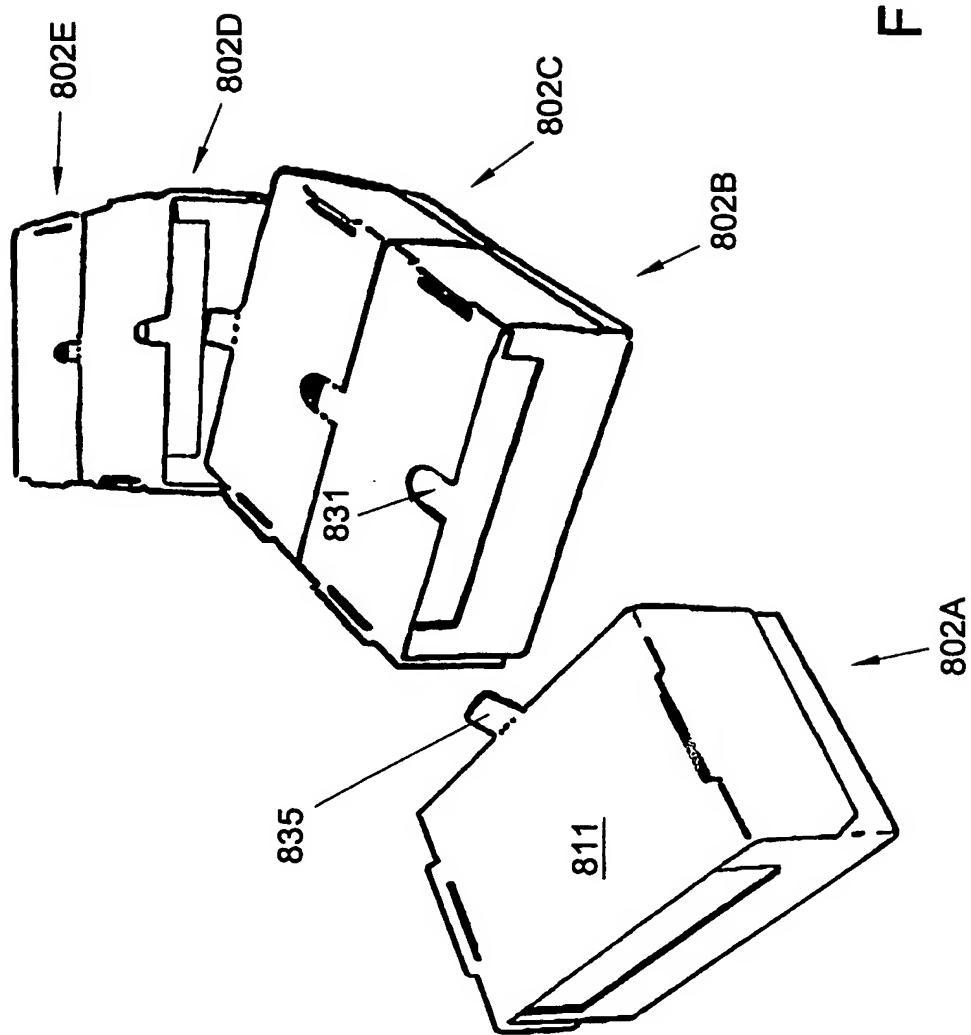


FIG. 11A

FIG. 11B



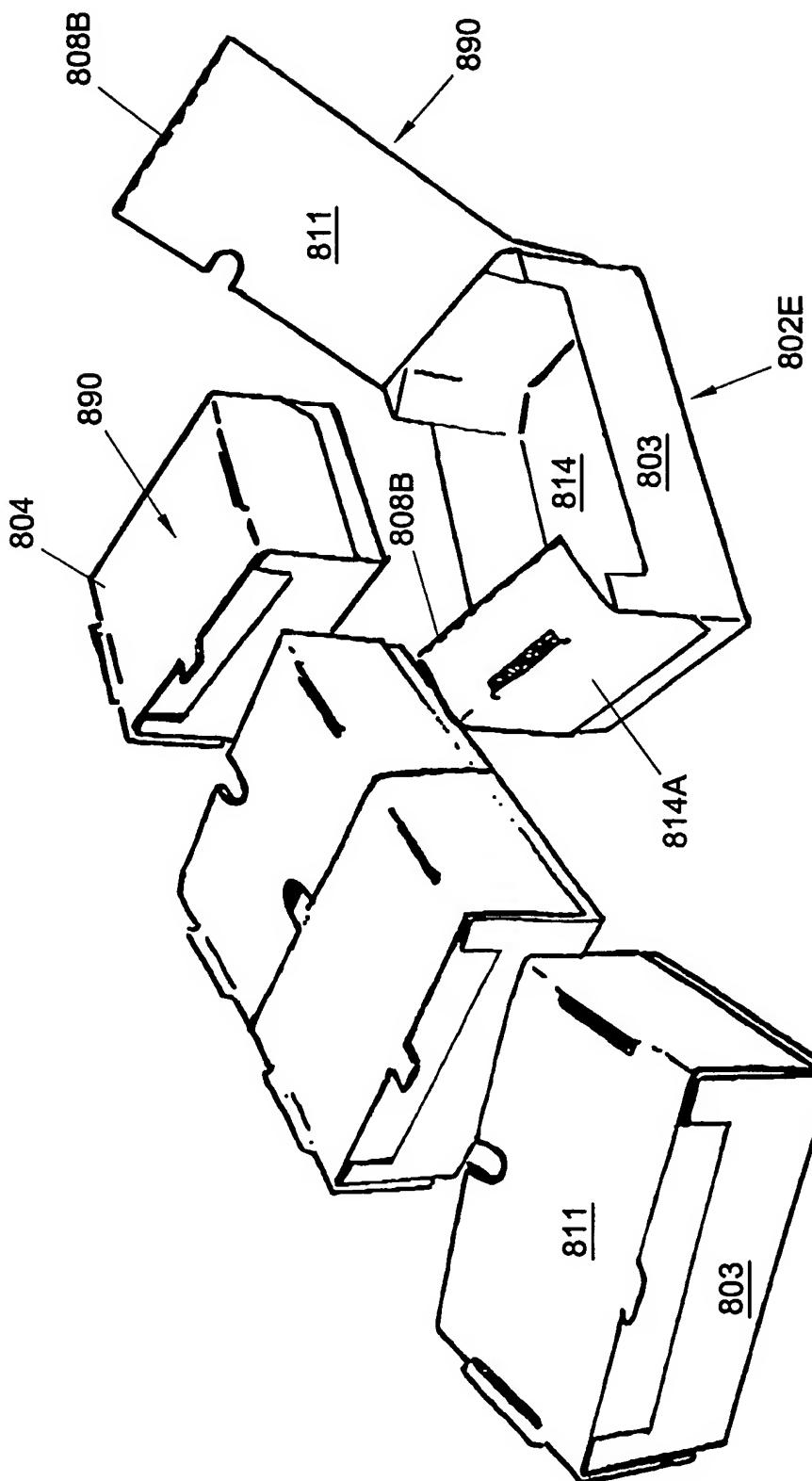
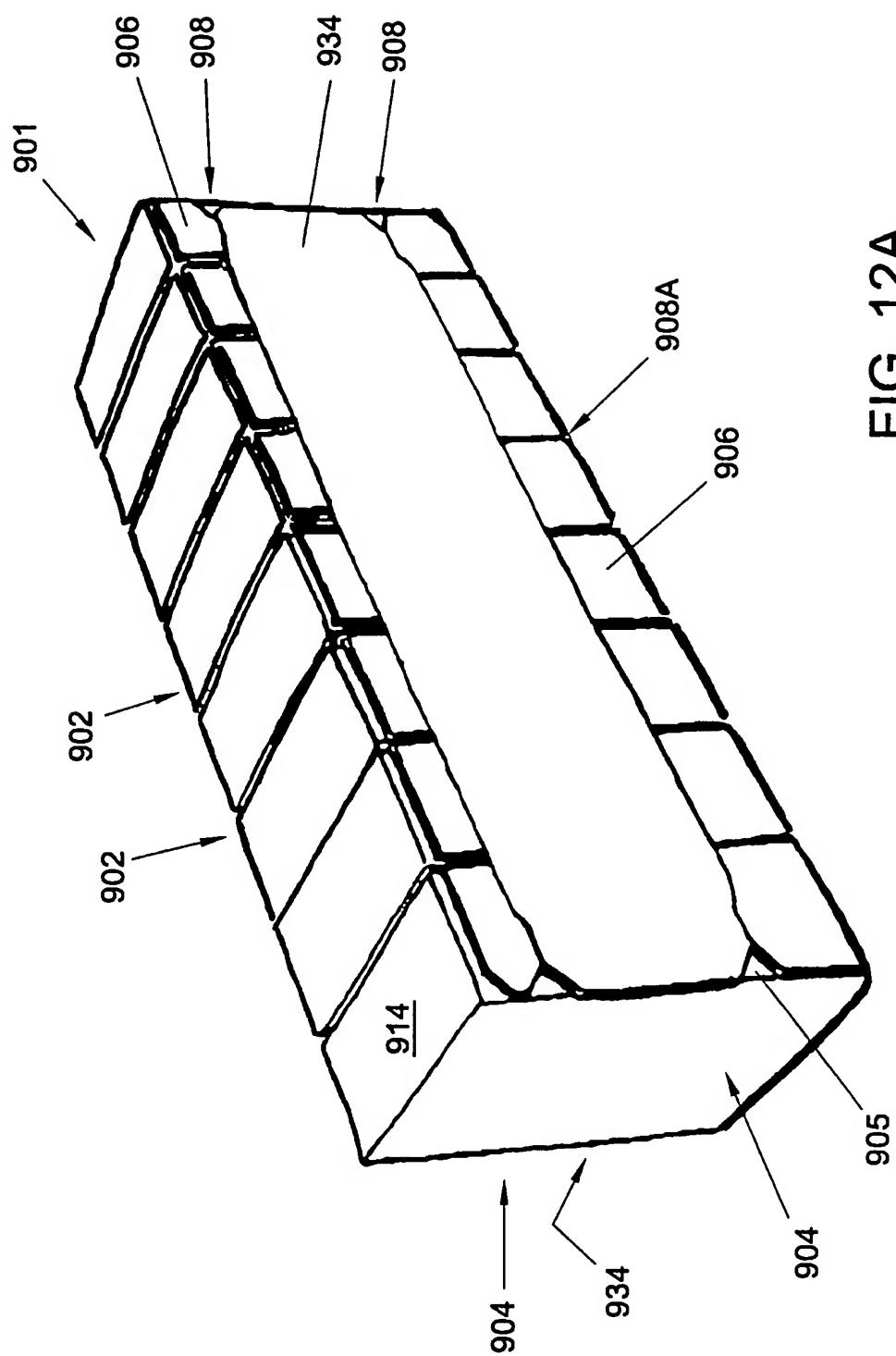


FIG. 11C



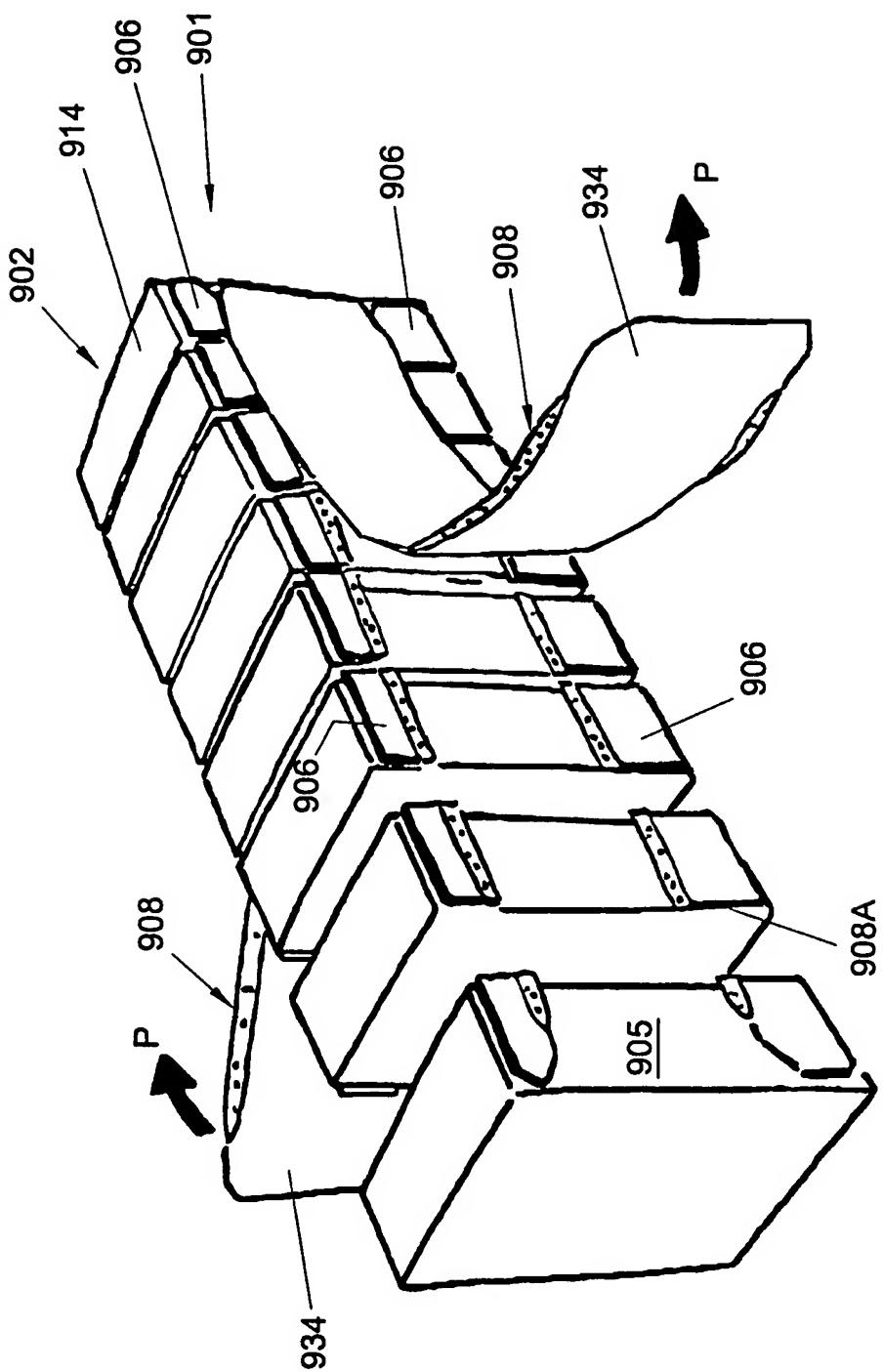
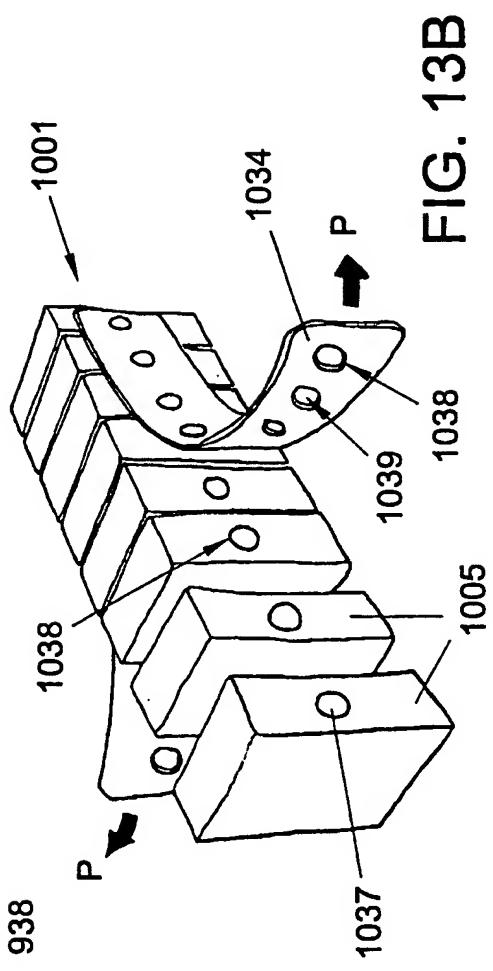
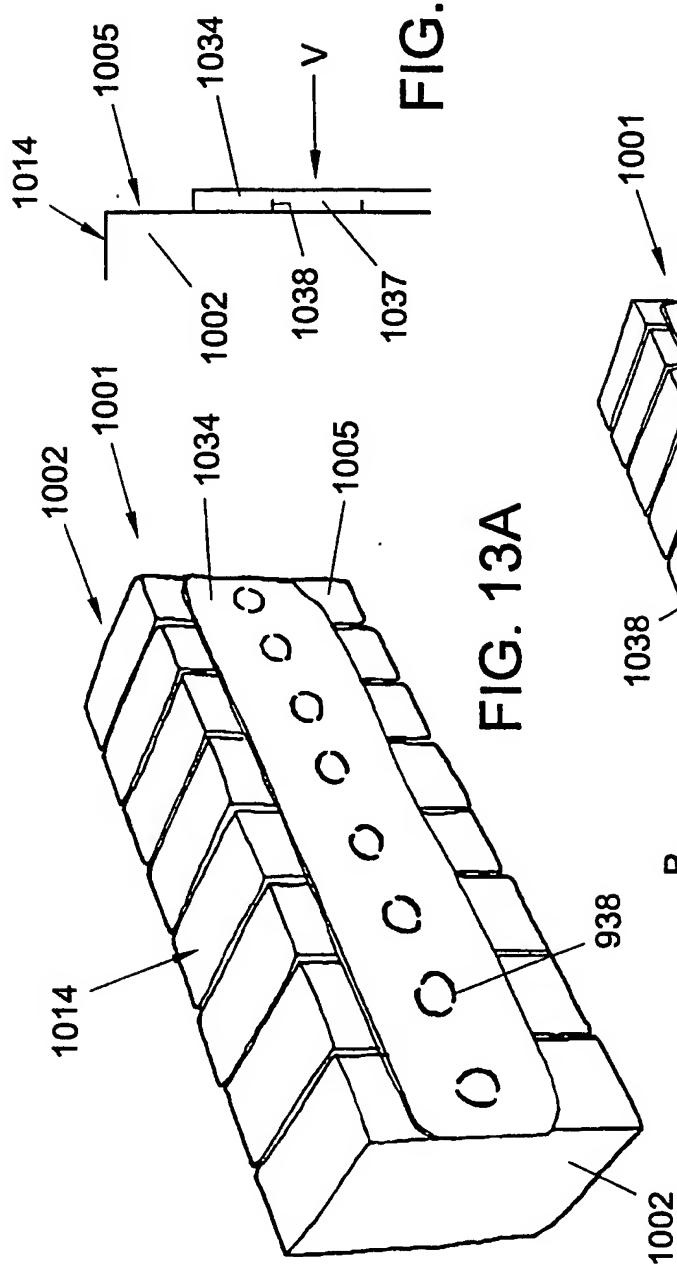


FIG. 12B



# INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 00/00347

**A. CLASSIFICATION OF SUBJECT MATTER**  
**IPC 7 B65D5/54**

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

**IPC 7 B65D**

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 260 345 A (SQUARE D STARKSTROM) 23 March 1988 (1988-03-23)	1,2,4-7, 9,11,12, 14-16, 18-20
Y	column 3, line 8 -column 6, line 25; figures 1-8 ---	3,13
Y	US 3 301 391 A (GUYER) 31 January 1967 (1967-01-31) the whole document ---	3
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		-/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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- \*A\* document defining the general state of the art which is not considered to be of particular relevance
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\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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\*&\* document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 October 2000	25/10/2000
Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Martens, L

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 00/00347

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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X	EP 0 481 695 A (ST REGIS PACKAGING) 22 April 1992 (1992-04-22)  figures 7-9 ---	1,2,4-7, 14-16, 18-20
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X	DE 27 49 941 A (PATENT-TREUHAND-GESELLSCHAFT ) 10 May 1979 (1979-05-10) the whole document ---	1,4,11, 12,15, 18-20
A	US 5 895 540 A (DAVID) 20 April 1999 (1999-04-20) figure 3 ----	16

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